CR220SM

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A.2 Explanation of Node

A.2.1 Front side

A.2.1.1 Front side of a node

Figure A.2.1.1-1 shows the front side of a node.
When there is an instruction to press the power source button, press Power switch.

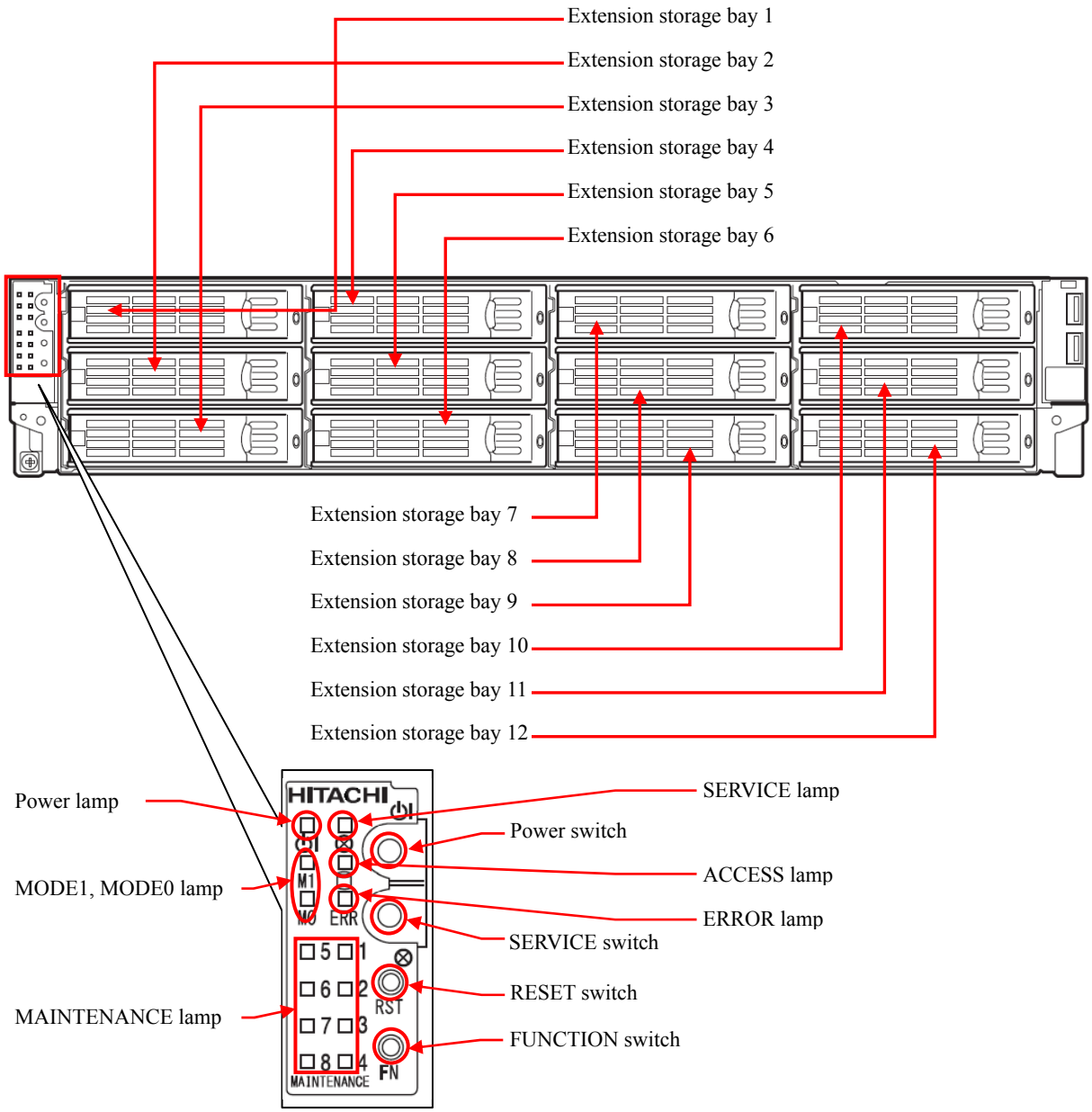

Figure A.2.1.1-1 Location of Power Switch, FUNCTION Switch, and SERVICE Switch

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Figure A.2.1.2-1 shows the front side of a node at the time of installing a front bezel.

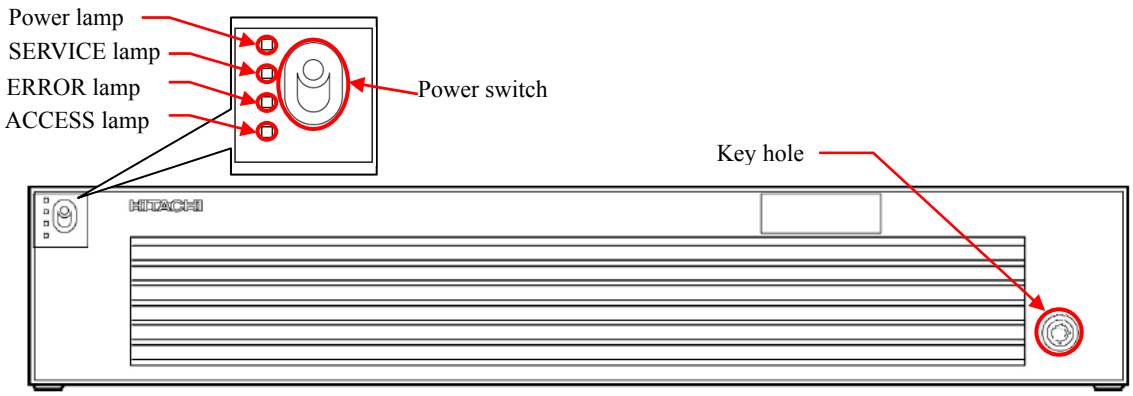

Figure A.2.1.1-2 Front bezel

NOTE: Prepare a bezel key to install or remove a front bezel.
If the maintenance personnel do not have the bezel key, borrow it from the customer.

(1) The installation procedure of the front bezel

(1-1) Hook the tab inside the front bezel to the guide on the left side mounting bracket.

NOTE: The opening angle of the front bezel to the node must be less than 30 degrees, or the front bezel will be damaged.

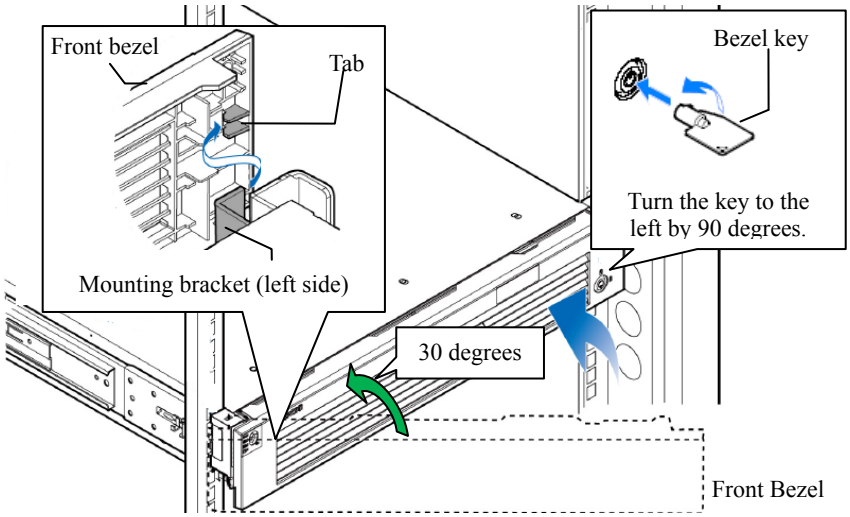

Figure A.2.1.1-3 Installing a Front bezel

(1-2) Push in the other side of the front bezel all the way.

(1-3) After pushing in, lock the front bezel with the bezel key.
A bezel key is fixed with adhesive tape inside the front bezel.

(2) The removal procedure of the front bezel

(2-1) Insert the key deeply into the key hole on the front bezel and turn it to the right by 90 degrees (or until the key would not turn).

(2-2) Perform the reverse procedure of “(1) The installation procedure of the front bezel.”

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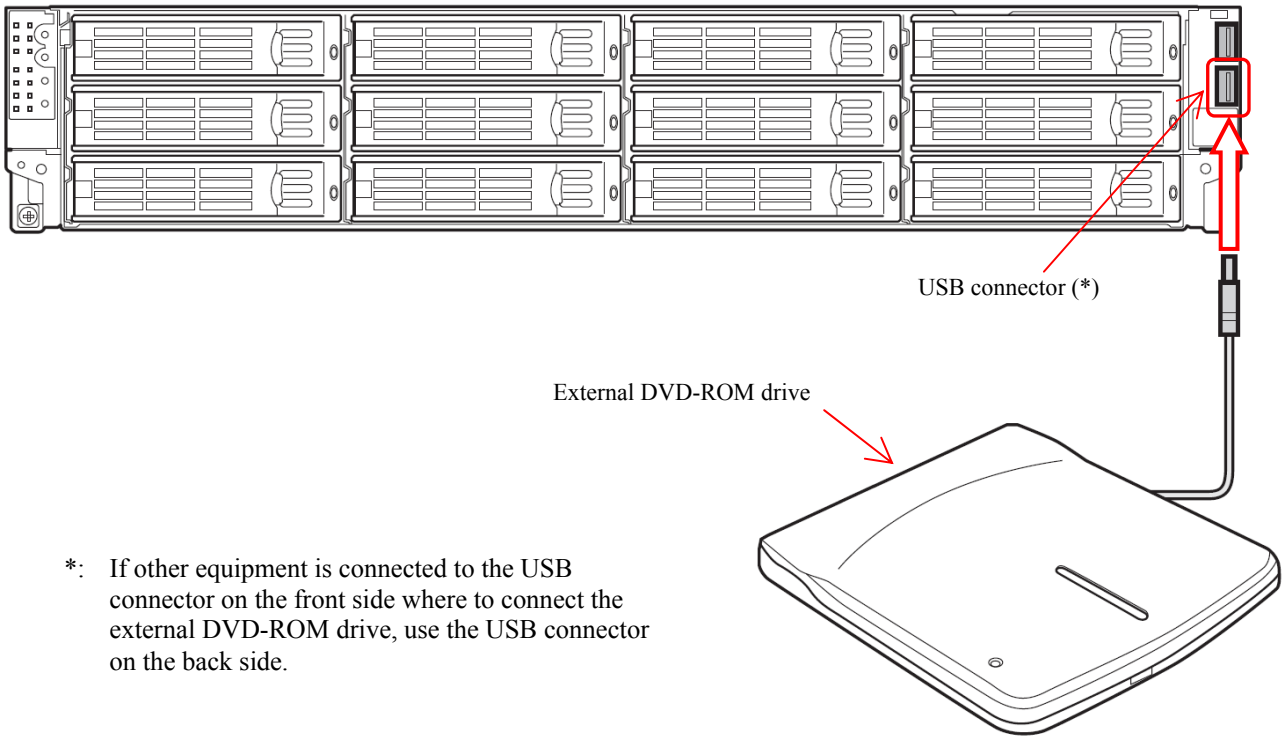
A.2.1.2 External DVD-ROM drive

CR220SM uses external DVD-ROM drive because it does not incorporate internal DVD-ROM drive. Figure A.2.1.2-1 shows the connecting part for external DVD-ROM drive.



*: If other equipment is connected to the USB connector on the front side where to connect the external DVD-ROM drive, use the USB connector on the back side.

Figure A.2.1.2-1 Connecting External DVD-ROM Drive

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A.2.2 Back side

CR220SM also incorporates extension storage bays on the back side.
Figure A.2.2-1 shows the location of extension storage bays on the back side.

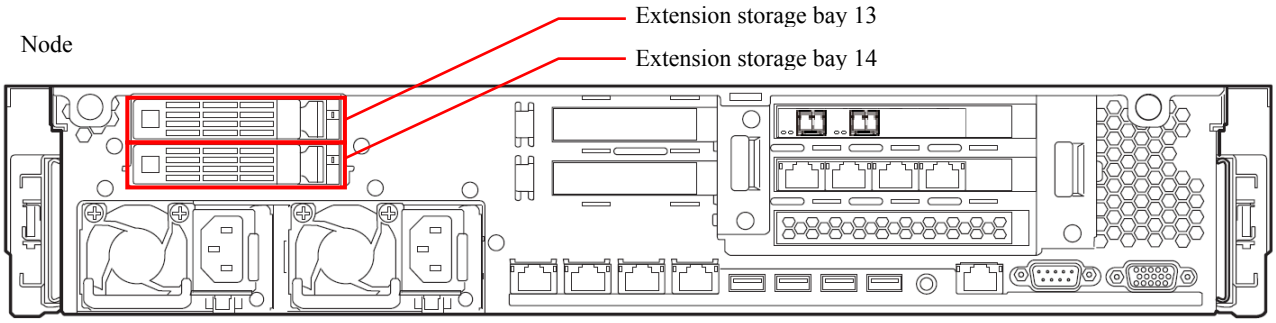

Figure A.2.2-1 Location of Extension storage bay on back side

A.2.2.1 Power source unit

Figure A.2.2.1-1 shows the mounted location of the power source unit. And Table A.2.2.1-1 shows the display status of the power source lamp.

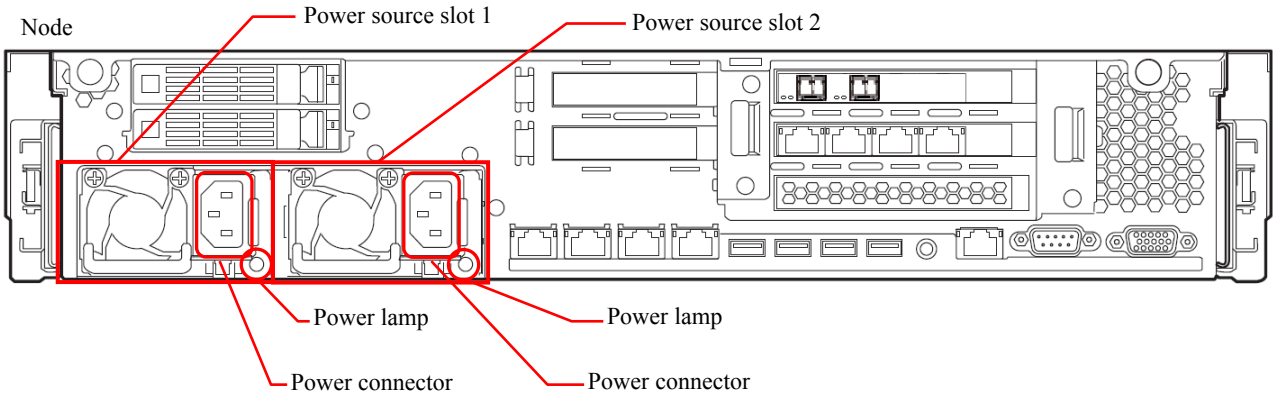

Figure A.2.2.1-1 Location of the mounted power source unit

Table A.2.2.1-1 Display status of the power source lamp of the power source unit

#	Display status of the power source lamp	Operation status
1	Turned off	No AC power supplied (the power source cord is unconnected.)
2	Blinking in green light	AC power supplied and Stand-by status (the power source code is connected, but the power switch is OFF.)
3	Turn on in green	Power ON and the normal operation (Power switch is ON.)
4	Blinking in amber light	Warning condition (the ambient temperature is high, etc.)
5	Turn on in amber	An error occurred. (a failure occurred or the power source code is dropped.)

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A.2.2.2 Port arrangement and port names

(1) Node of CR220SM in the single node configuration
Figure A.2.2.2-1 shows the port names on the backside of a node.
When the maintenance tool is used, port names in the diagram are shown.

'Table A.2.2.2-1 Confirmation Table for the Port Allocation of Node' shows the correspondence between the port names displayed on the maintenance CLI (names on the OS) and the actual port positions of a node.
(a) to (e) show the rear view of the node in each option card mounting pattern.
'Table A.2.2.2-2 Confirmation Table for the Port Allocation of Node (when Additional FC card is Installed)' shows the correspondence of the port location when an additional FC card is installed, and (f) to (j) show the rear view of the node.

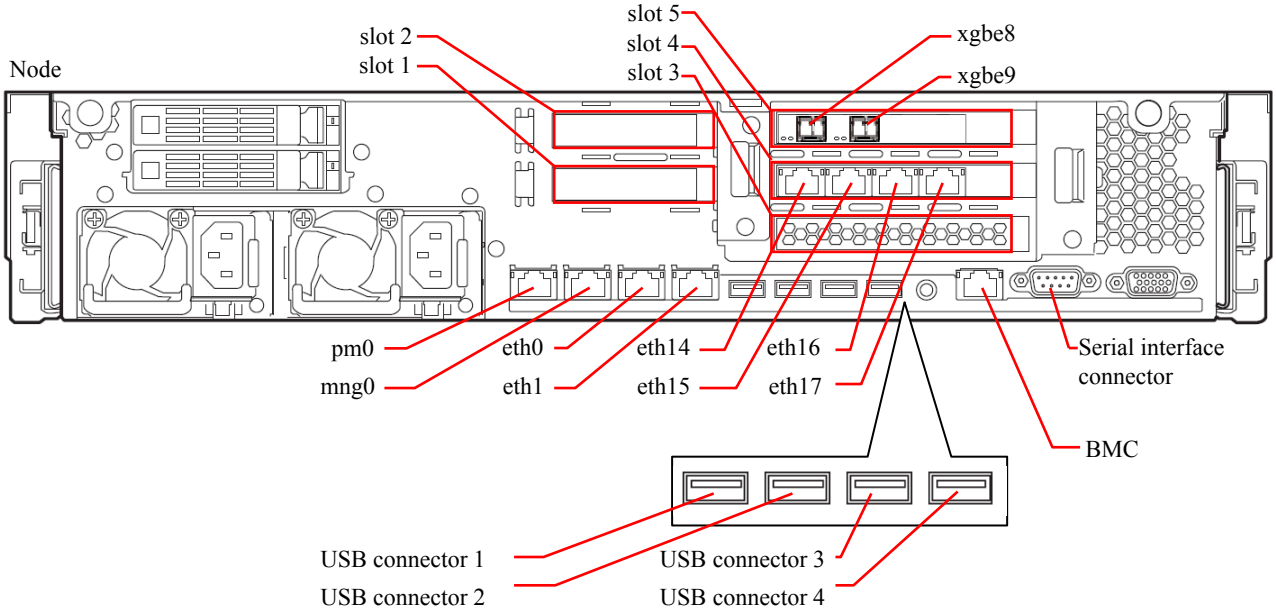

Figure A.2.2.2-1 Rear View of the Node (example)

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Table A.2.2.2-1 Confirmation Table for the Port Allocation of Node

#	Position	Physical port name	Interface name			Application	Remarks
			GbE	10GbE	FC		
1	On-board	1	eth1			Data port	—
2		2	eth0			Data port	—
3		3	mng0			Management port	—
4		4	pm0			Private Maintenance port	—
5		M	-(none)			BMC	—
6	Extension slot 1					Not used	
7	Extension slot 2					Not used	
8	Extension slot 3					Not used	
9	Extension slot 4	1	eth17			Data port	PCI-Express gen3<×4>
10		2	eth16			Data port	
11		3	eth15			Data port	
12		4	eth14			Data port	
13	Extension slot 5	0		xgbe9		Data port	PCI-Express gen3<×8>
14		1	eth21	xgbe8		Data port	
15		2	eth20			Data port	
16		3	eth19			Data port	
17		4	eth18			Data port	

The following shows the five mounting patterns in each option card configuration.

(a) No option card

Node

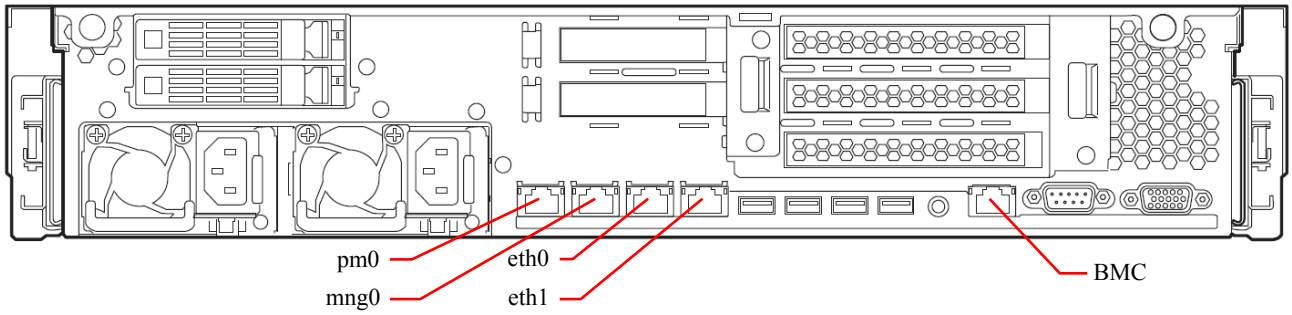

Figure A.2.2.2-2 Rear View of the Node (1)

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(b) Mounting 4 port GbE card in the extension slot 5

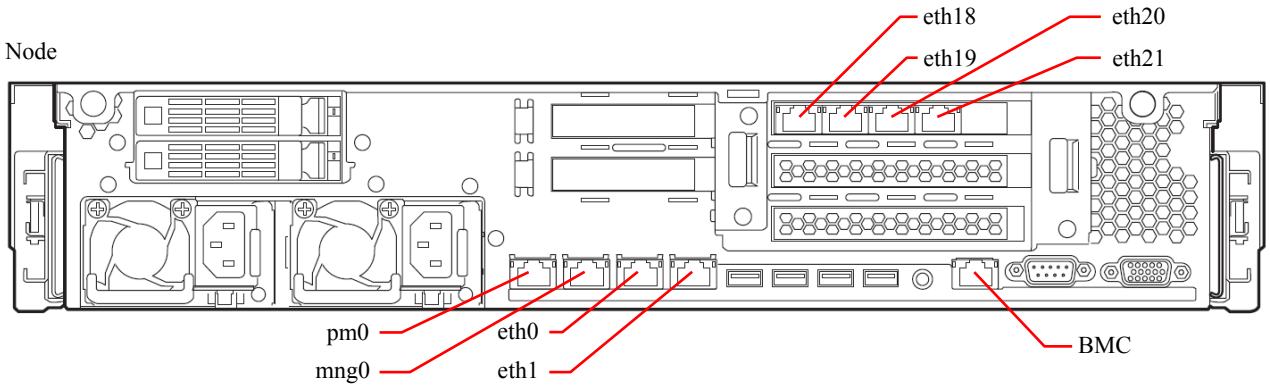

Figure A.2.2.2-3 Rear View of the Node (2)

(c) Mounting 4 port GbE card in the extension slot 4 and in the extension slot 5

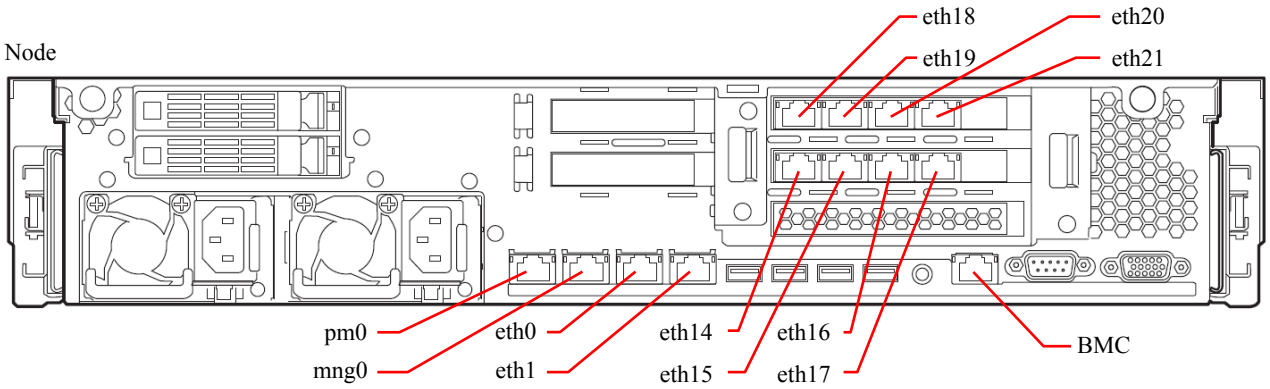

Figure A.2.2.2-4 Rear View of the Node (3)

(d) Mounting 2 port 10GbE card in the extension slot 5

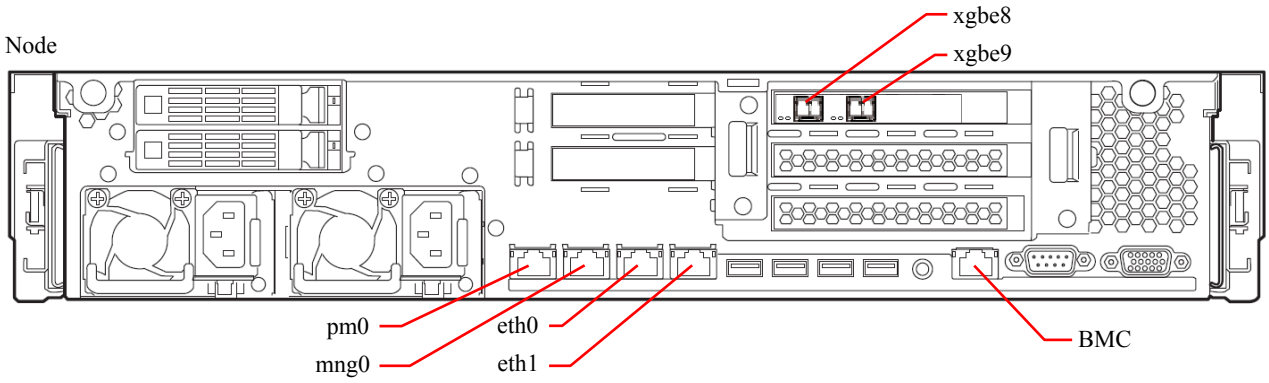

Figure A.2.2.2-5 Rear View of the Node (4)

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(e) Mounting 4 port GbE card in the extension slot 4, and 2 port 10GbE card in the extension slot 5

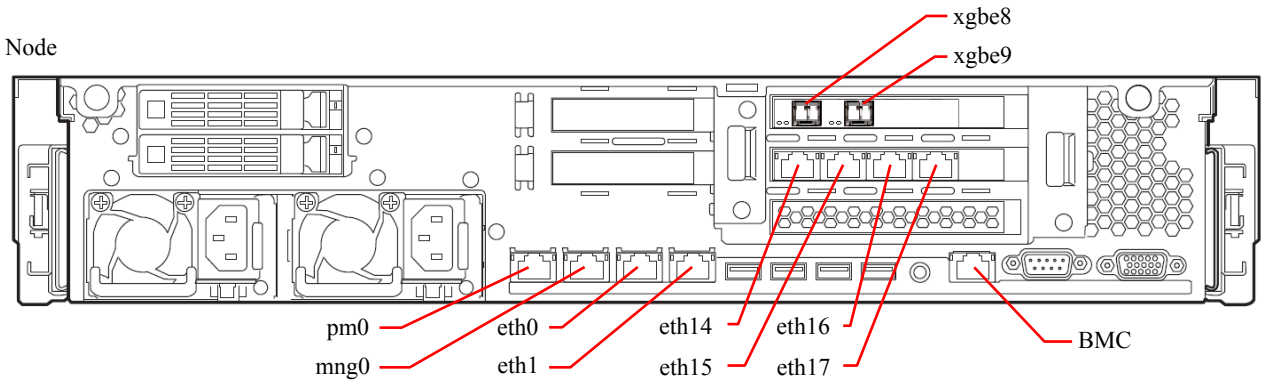

Figure A.2.2.2-6 Rear View of the Node (5)

Table A.2.2.2-2 Confirmation Table for the Port Allocation of Node (when Additional FC card is Installed)

#	Position	Physical port name	Interface name			Application	Remarks
			GbE	10GbE	FC		
1	On-board	1	eth1			Data port	—
2		2	eth0			Data port	—
3		3	mng0			Management port	—
4		4	pm0			Private Maintenance port	—
5		M	-(none)			BMC	—
6	Extension slot 1					Not used	
7	Extension slot 2	0	fc0002			FC port – array connection	PCI-Express gen2<×4>
8		1	fc0003			FC port – array connection	
9	Extension slot 3					Not used	
10	Extension slot 4	1	eth17			Data port	PCI-Express gen3<×4>
11		2	eth16			Data port	
12		3	eth15			Data port	
13		4	eth14			Data port	
14	Extension slot 5	0		xgbe9		Data port	PCI-Express gen3<×8>
15		1	eth21	xgbe8		Data port	
16		2	eth20			Data port	
17		3	eth19			Data port	
18		4	eth18			Data port	

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The following shows the five mounting patterns in each option card configuration.

(f) No option card

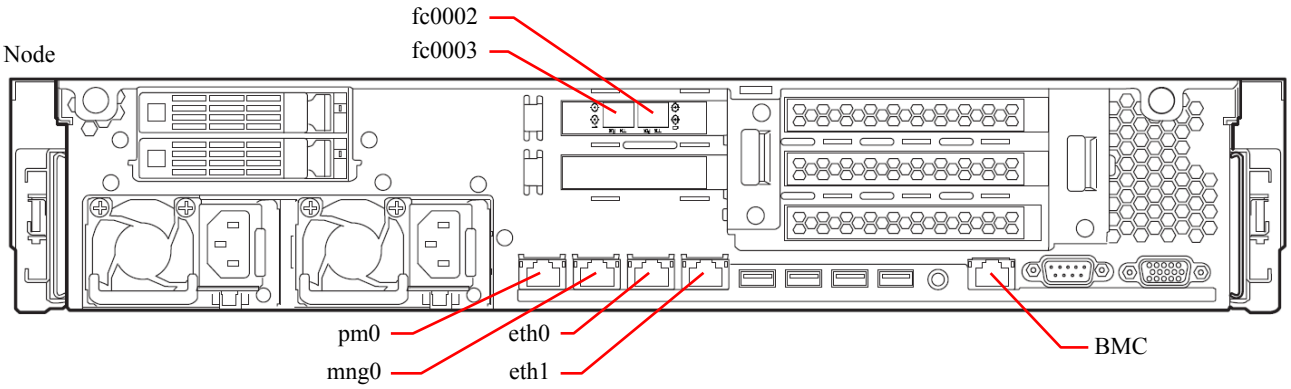

Figure A.2.2.2-7 Rear View of the Node (6)

(g) Mounting 4 port GbE card in the extension slot 5

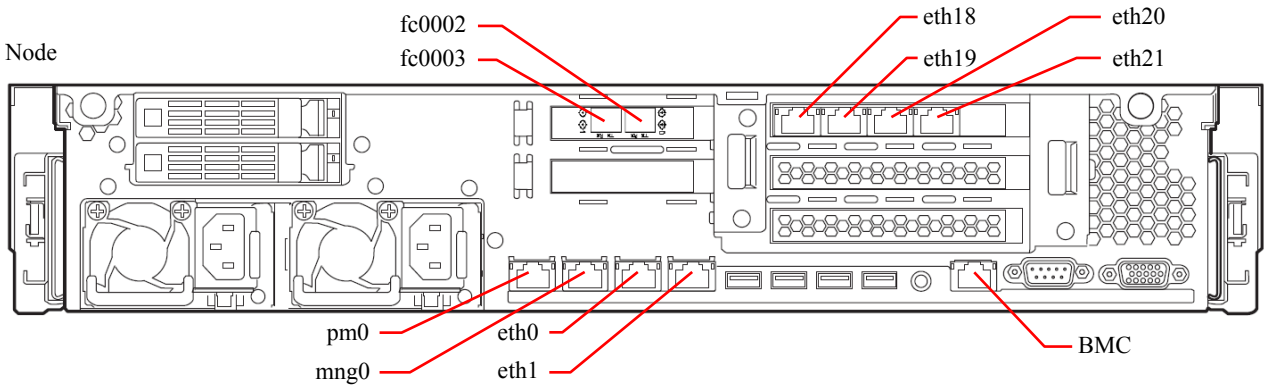

Figure A.2.2.2-8 Rear View of the Node (7)

(h) Mounting 4 port GbE card in the extension slot 4 and in the extension slot 5

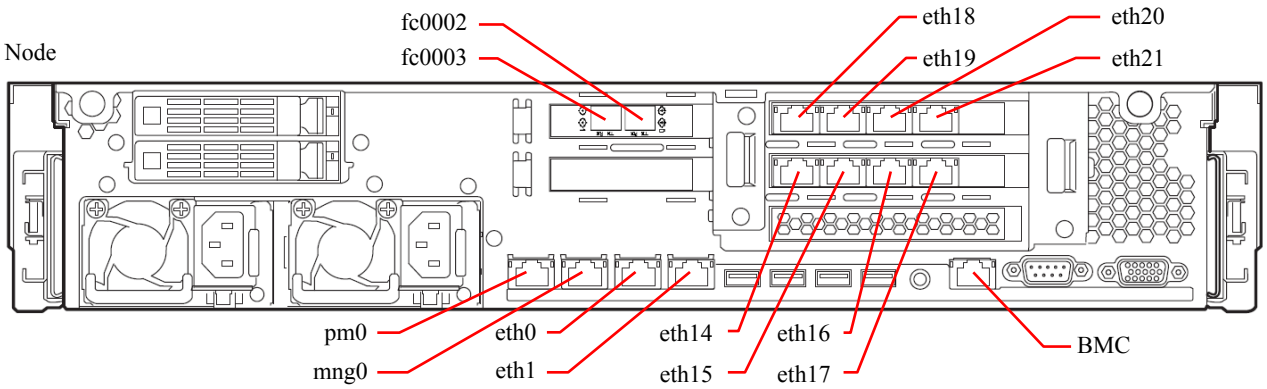

Figure A.2.2.2-9 Rear View of the Node (8)

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(i) Mounting 2 port 10GbE card in the extension slot 5

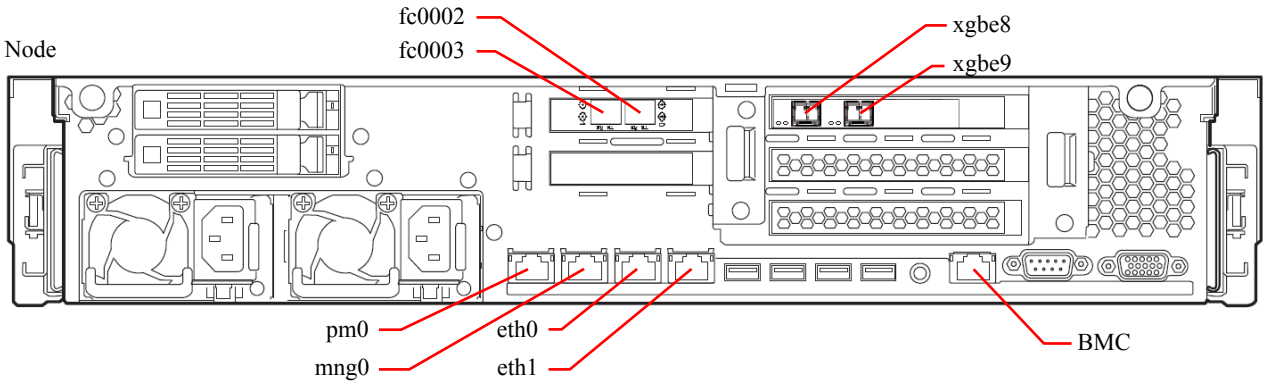

Figure A.2.2.2-10 Rear View of the Node (9)

(j) Mounting 4 port GbE card in the extension slot 4, and 2 port 10GbE card in the extension slot 5

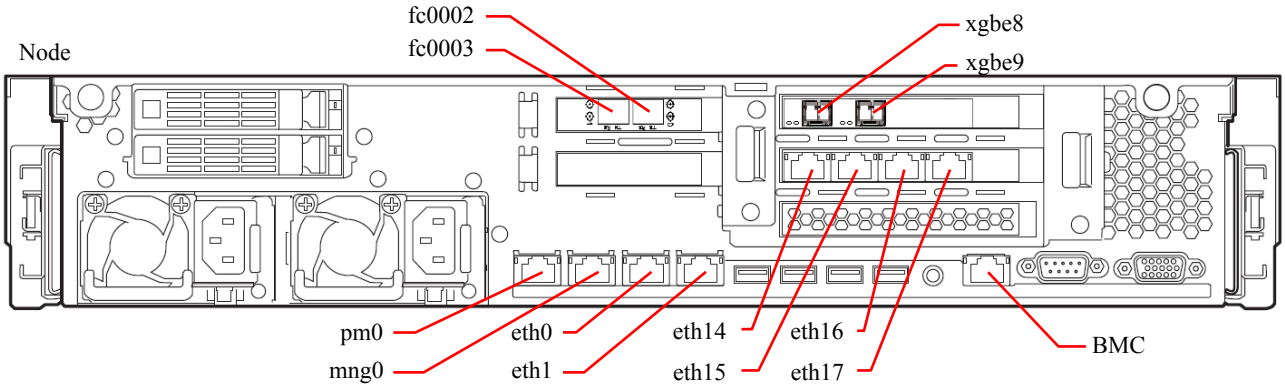

Figure A.2.2.2-11 Rear View of the Node (10)

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A.2.3 LAN Cable

(1) In the cluster configuration
CR220SM does not support the cluster configuration.

(2) In the single node configuration
(a) Connecting the front-end LAN
Figure A.2.3-1 shows a case of front-end LAN connection by using 2 LAN cables, and Figure A.2.3-2 shows a case of front-end LAN by using one LAN cable.

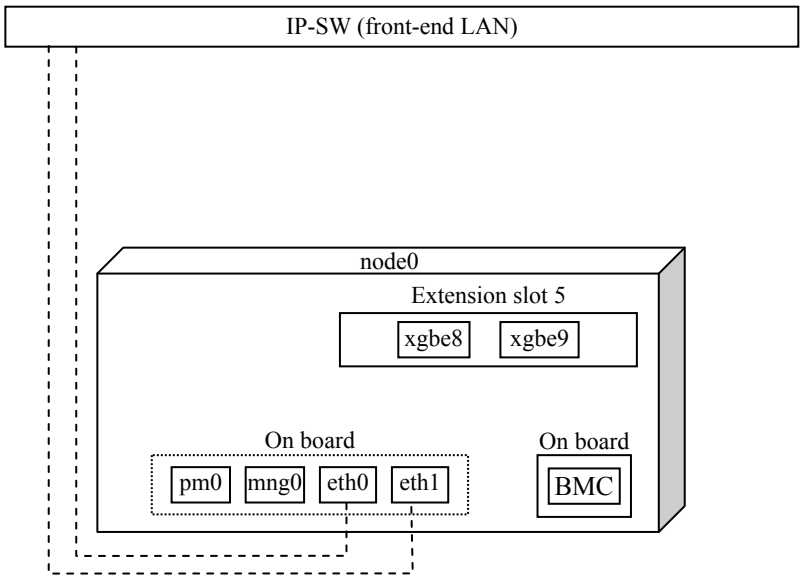

Figure A.2.3-1 Front-end LAN Connection by using 2 LAN cables (Configuration using trunk 2 Data ports)

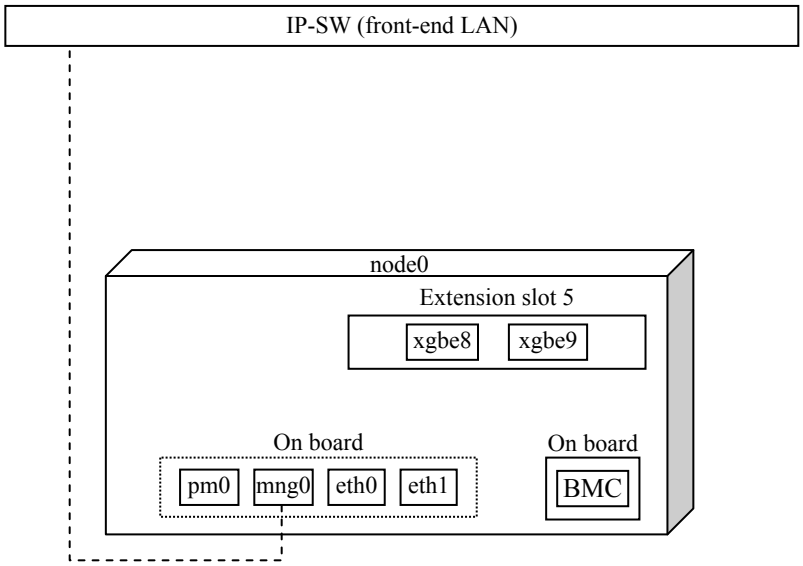

Figure A.2.3-2 Front-end LAN Connection by using one LAN cable (Configuration using Management port)

(b) Connecting the private maintenance ports
Private Maintenance port should be connected directly with a maintenance PC.

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A.2.4 Notes on Port when Maintenance Mode is Used

This is unsupported mode in this model.

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A.4.6 Example of Installing the Node in the Configuration of HDI for Cloud (single node)

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A.4 Installing the Nodes

A.4.1 Example of Installing the Node in the Basic Configuration (cluster node)

HDI does not support Basic Configuration.

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A.4.2 Example of Installing the Node in the Basic Configuration (single node)

HDI does not support Basic Configuration.

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A.4.3 Example of Installing the Node in the Configuration of HDI for HCP (cluster node)

CAUTION

To prevent a rack frame fall, install the heavier devices on the lower positions as much as possible. The devices must be installed in the order of a position from the bottom. Please make sure when you install nodes on your rack frame.

The following figure shows an example of installing the nodes of Hitachi Data Ingestor on a rack on which the Hitachi Content Platform has been installed.
Installing Hitachi Data Ingestor including Management LAN IP-SW requires a 3U rack space. Figure A.4.3-1 shows an example of installing the basic chassis of AMS2000 series and three extension chassis mounted from the bottom of the rack frame. In this case, totally 13U rack spaces are required with the basic chassis and three extension chassis.
When connecting with USP V, USP VM, or VSP, the disk array subsystem will not be installed on a rack frame of which the node is installed.

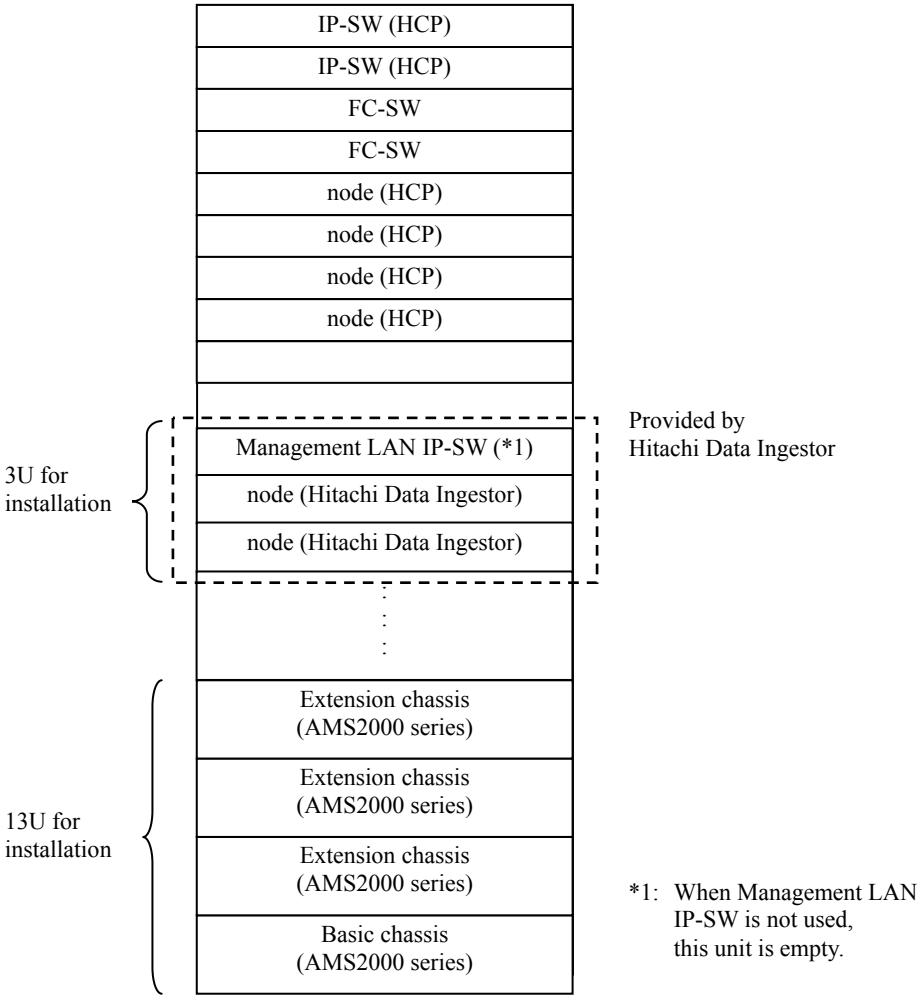

Figure A.4.3-1 Example of Installing the node in the Configuration of HDI for HCP

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A.4.4 Example of Installing the Node in the Configuration of HDI for HCP (single node)

CAUTION

To prevent a rack frame fall, install the heavier devices on the lower positions as much as possible. The devices must be installed in the order of a position from the bottom. Please make sure when you install nodes on your rack frame.

The following figure shows an example of installing the nodes of Hitachi Data Ingestor on a rack on which the Hitachi Content Platform has been installed.
There are no Management LAN IP-SW, Array Storage, and KVM in HDI single node configuration, so HDI needs only 1U for one CR220SM.
Figure A.4.4-1 shows an example of installing the basic chassis and 3 extended chassis of AMS2000 in the order of a position from the bottom.

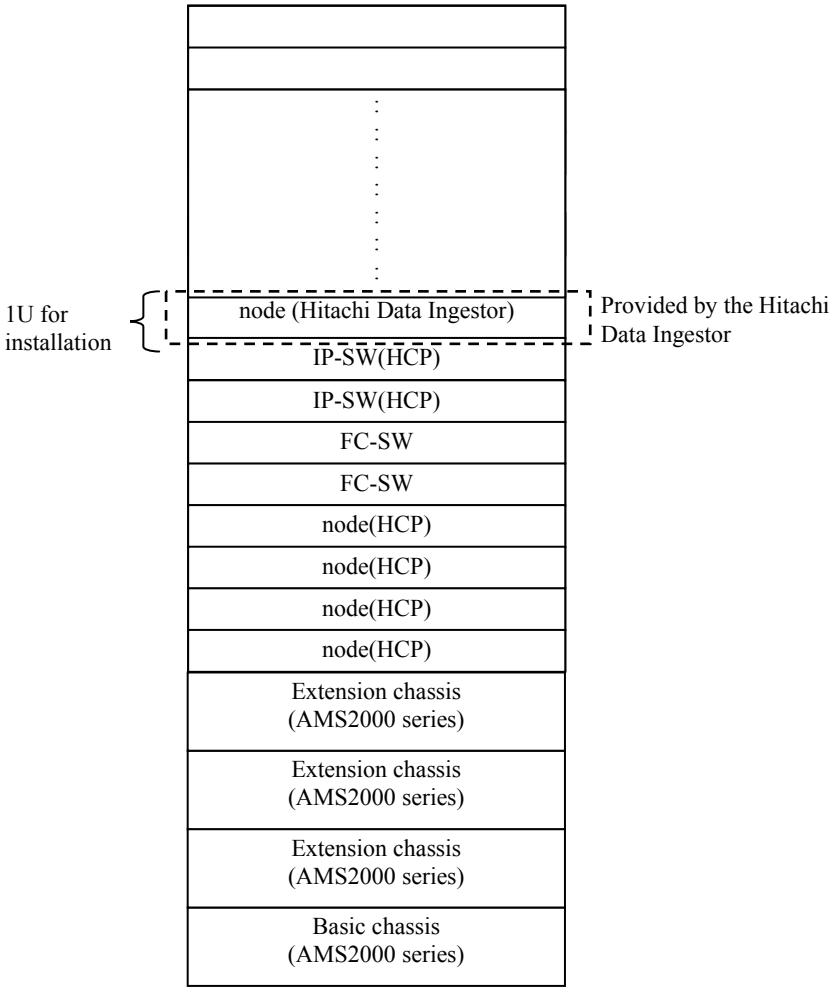

Figure A.4.4-1 Example of Installing the node in the Configuration of HDI for HCP (single node)

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A.4.5 Example of Installing the Node in the Configuration of HDI for Cloud (cluster node)

CAUTION

To prevent a rack frame fall, install the heavier devices on the lower positions as much as possible. The devices must be installed in the order of a position from the bottom. Please make sure when you install nodes on your rack frame.

The disk array subsystem in the figure shows an example with AMS2000 series.

Figure A.4.5-1 shows an example of installing the nodes of HDI for Cloud configuration (cluster node).

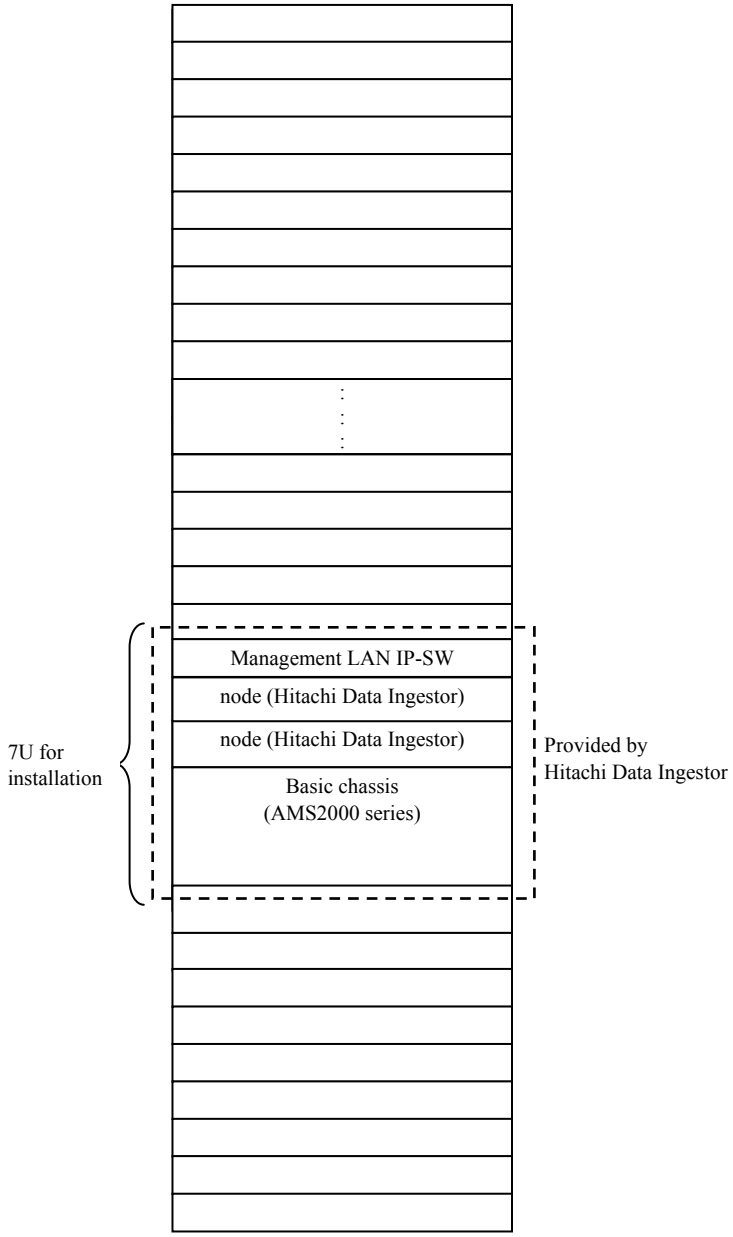

Figure A.4.5-1 Example of Installing the node in the Configuration of HDI for Cloud (cluster node)

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A.4.6 Example of Installing the Node in the Configuration of HDI for Cloud (single node)

CAUTION

To prevent a rack frame fall, install the heavier devices on the lower positions as much as possible. The devices must be installed in the order of a position from the bottom. Please make sure when you install nodes on your rack frame.

Install only a node in the configuration of HDI for Cloud (single node) because any of disk array subsystem, Maintenance LAN IP-SW, KVM is not used for this configuration.

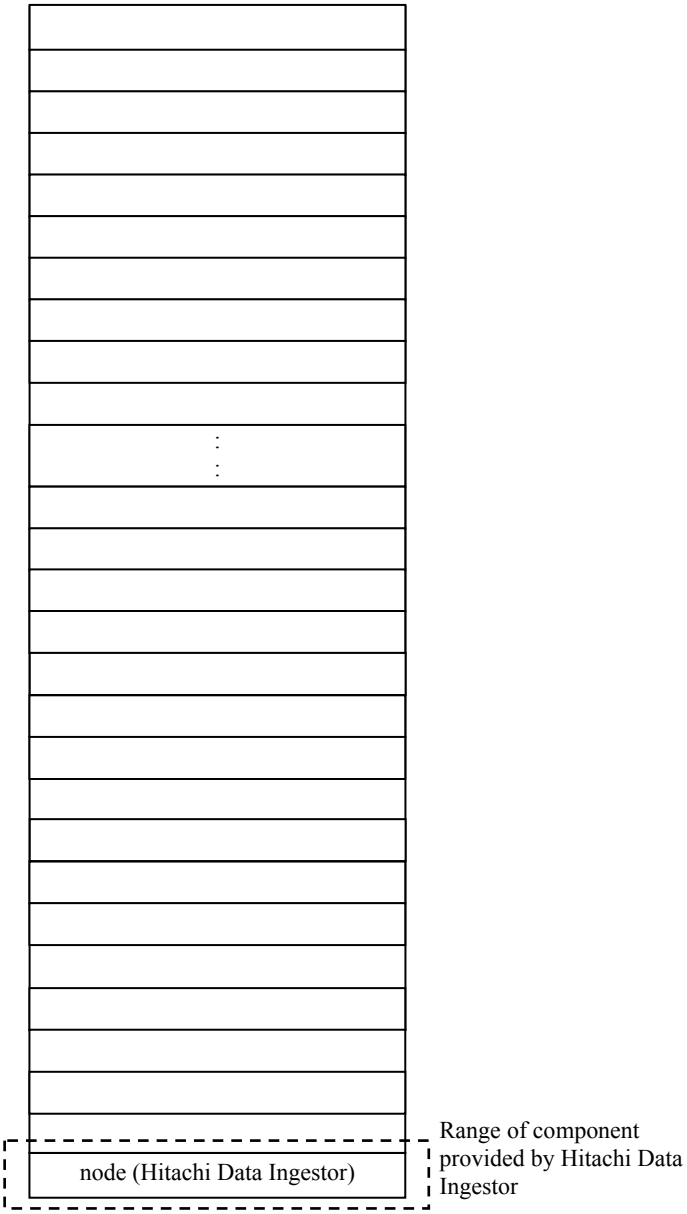

Figure A.4.6-1 Example of installing the node of the configuration of HDI for Cloud (single node)

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B.1 Connection and Confirmation of OS Console

B.1.1 Confirmation of KVM Connection

B.1.2 Startup Confirmation of the OS by Using KVM

B.1.3 Connection Confirmation of the Remote Console

B.1.4 Startup Confirmation of OS by Using Remote Console

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B.1 Connection and Confirmation of OS Console

There are two methods of connection to the console of OS. One is the connection with KVM, and the other is the connection with remote console.

KVM is an input/output device with a hardware display monitor, and the command operation for the node can be executed. Generally, KVM can connect to multiple nodes and it uses by switching nodes. Note that KVM is not used in this model.

Remote Console is a function that can be executed a command operation for the node on a screen of a maintenance PC by installing the remote console application to the maintenance PC. Remote console uses in the case other than installation operation and BMC failures.

For more details about Remote Console Application, refer to “Remote Console Application User’s Guide”.

B.1.1 Confirmation of KVM Connection

Refer to ‘B.1.3 Connection Confirmation of the Remote Console’ in this model.

B.1.2 Startup Confirmation of the OS by Using KVM

Refer to ‘B.1.4 Startup Confirmation of OS by Using Remote Console’ in this model.

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B.1.3 Connection Confirmation of the Remote Console

NOTE: In the case of BMC port failure, borrow a monitor and a keyboard from the system administrator to connect to the node.

The console must be available to use before executing setup operation. Confirm that the following descriptions are connected certainly.

(1) Verify that the power source cable of the maintenance PC is connected.
(2) Verify that the network segment of the BMC port and the network segment of the maintenance PC are the same.

If the network segment is different, change the setting of maintenance PC to be the same network segment. The following shows the conceivable IP address of the BMC port.

- Before the setup, the IP address may be 192.168.100.100.
- After the setup, the IP address may be the following.

The IP address of the maintenance port is the same segment with the one that specified during installing, and the host part is fixed as 40.
For example, when the IP address of the maintenance port is 10.0.0.51, the IP address of the BMC port is 10.0.0.40.

If the IP address of the BMC port is other than the above IP address, confirm with the system administrator.

(3) Verify that the LAN port of the maintenance PC and the BMC port of the node are connected with a LAN cable (cross-cable).

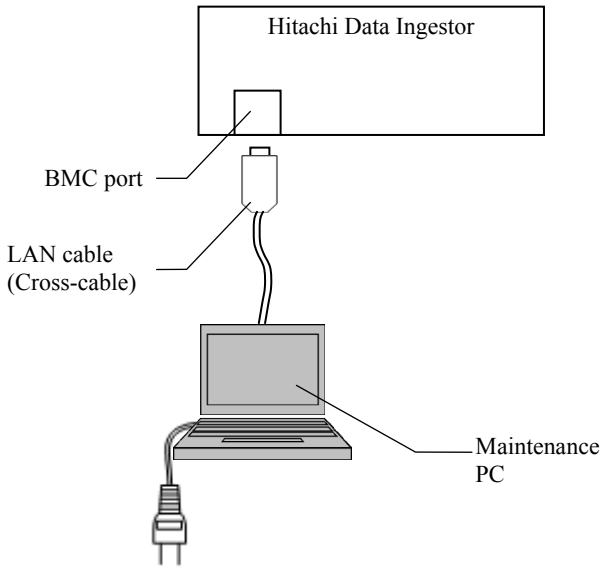

Figure B.1.3-1 Remote console connection example

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B.1.4 Startup Confirmation of OS by Using Remote Console

If the OS is already installed, it is available to check if the OS is running or not with using the console window.

This procedure assumes that the connection confirmation of the console with the description of ‘B.1.3 Connection Confirmation of the Remote Console’.

The following shows the procedure.

(1) Start up the Internet Explorer from the maintenance PC.
Click [Start]-[Program]-[Internet Explorer].

(2) Input the following address in the address bar on the Internet Explorer.
“http://<IP address of the BMC>”

Input the IP address confirmed at ‘B.1.3 Connection Confirmation of the Remote Console’ for the IP address of the BMC.

(3) Make sure that the BMC login window is displayed.

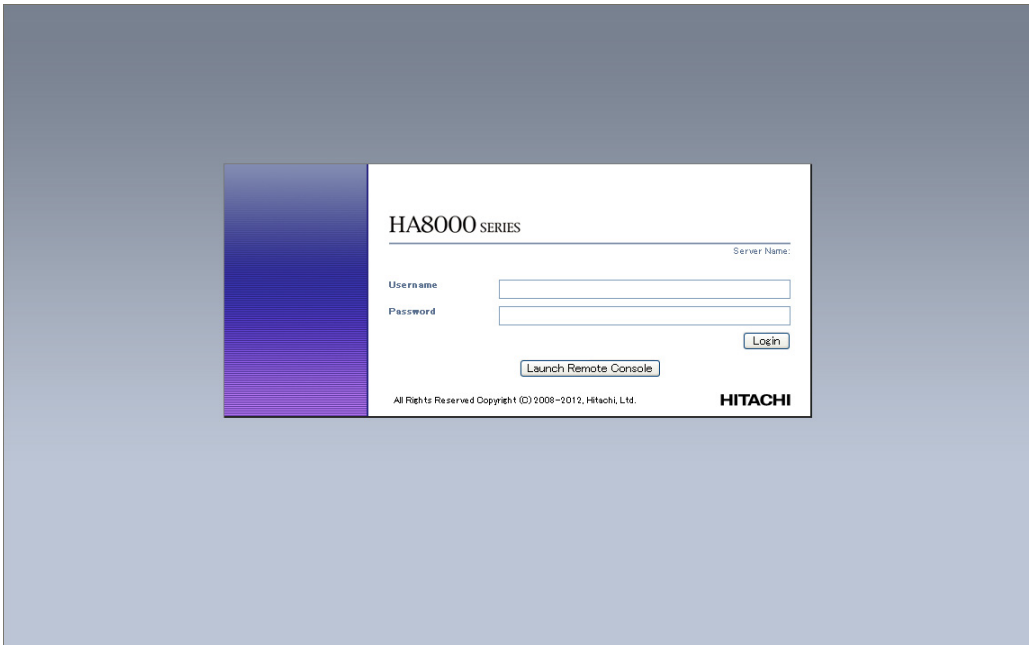

Figure B.1.4-1 BMC Login window 1

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(4) Enter “ceconsl” in the [Username], and “cepasswd” in the [Password].
After the input, click [Login].

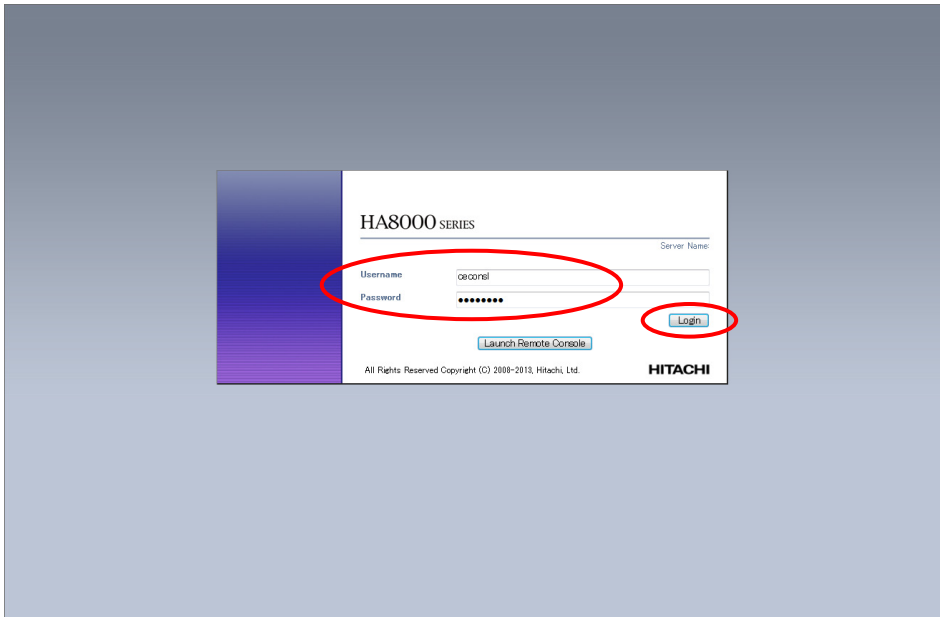

Figure B.1.4-2 BMC Login window 2

(5) The Server Information window is displayed as shown in Figure B.1.4-3.
Click [Server Settings].

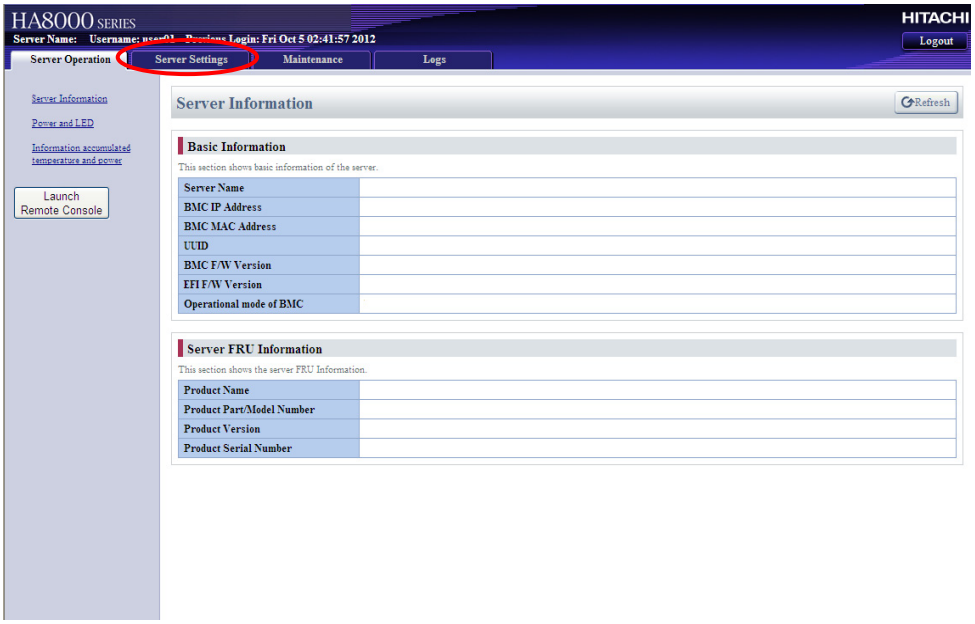

Figure B.1.4-3 Server Information window 1

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(6) The Language Settings window is displayed as shown in Figure B.1.4-4.
Click [Remote KVM].

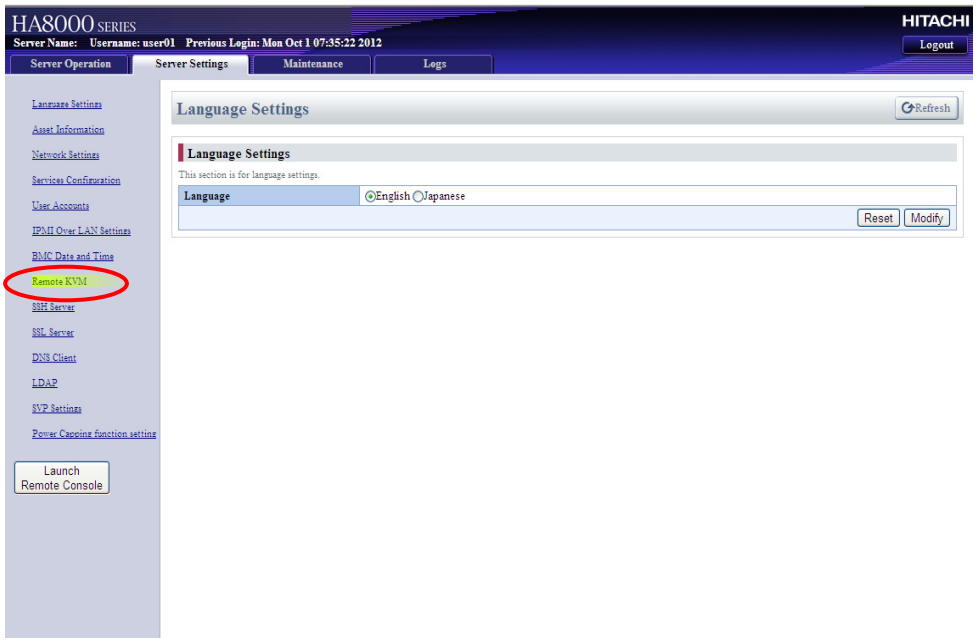

Figure B.1.4-4 Language Settings window

(7) The Remote KVM Settings window is displayed as shown in Figure B.1.4-5.
Select [RELATIVE Mode], and click [Modify].

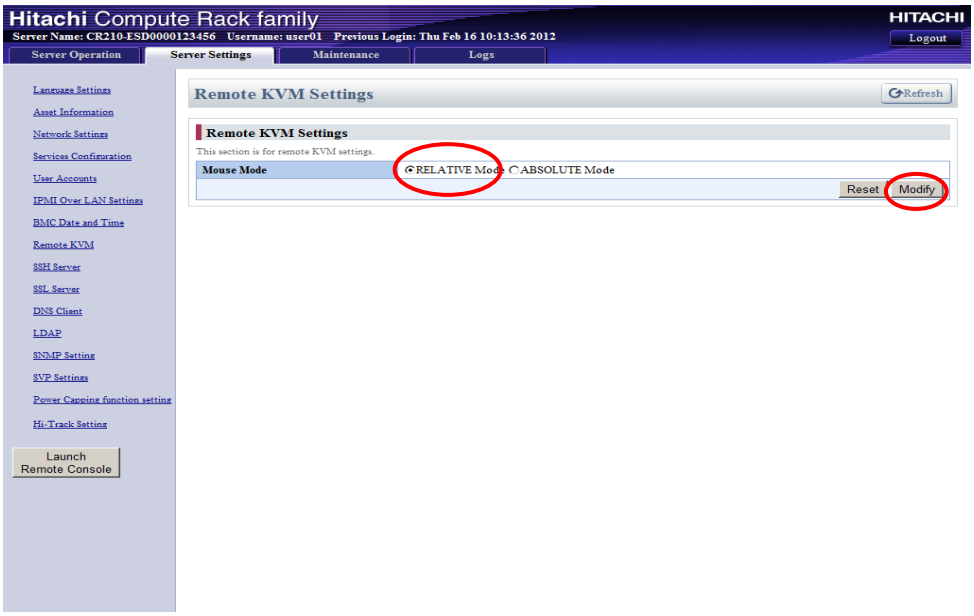

Figure B.1.4-5 Remote KVM Settings window

NOTE: When using a mouse in “RELATIVE” mode, the mouse cursor of the console terminal and that of the remote console window may point different positions depending on the OS of the system. It is recommended to hide the mouse cursor of the console terminal.

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(8) Launch Remote Console.
If you have logged in to the BMC, perform the steps from (a-1) to (a-3).
If you have not logged in to the BMC, perform the step (b-1) and step (b-2).

(a-1) Click [Launch Remote Console] button on the left side of the window.

Figure B.1.4-6 Server Information window 2

(a-2) The Launch Remote Console window is displayed as shown in Figure B.1.4-7. Enter “ceconsl” in [User ID], “cepasswd” in [Password], and then click [Connect] button.

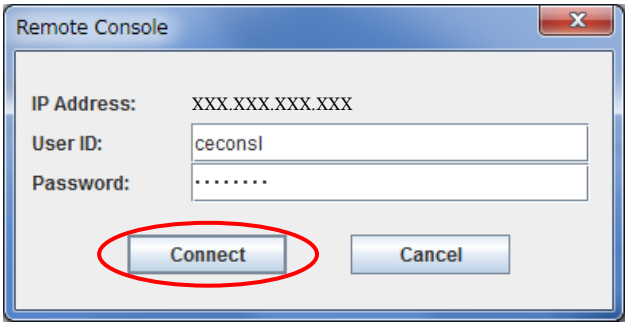

Figure B.1.4-7 Launch Remote Console window 1

NOTE: If the JRE version of the maintenance PC is JRE 7 update21 or later, a security warning may be displayed and the remote console may not be activated.
Refer to “Maintenance Tool ‘1.2.1 Requirements for the maintenance PC’ (MNTT 01-0030).”

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(a-3) Log out by clicking [Logout] button on the upper right of the window. The Console window shown in Figure B.1.4-11 will be displayed, and make sure not to close this window.

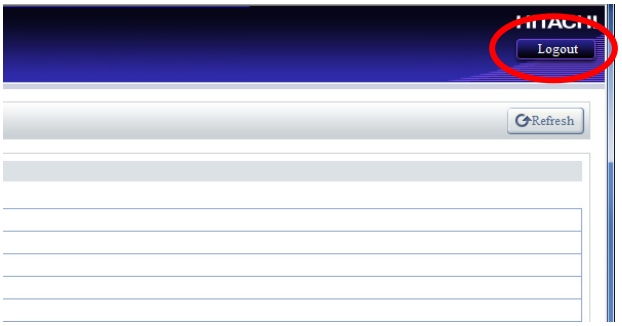

Figure B.1.4-8 Web Console window

NOTE: If you close the browser before logging out, the log-in status is held for 30 minutes until automatic logout is activated. Up to two users can log in to the Web console at the same time, so you cannot log in if two users have already logged in.

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(b-1) Click [Launch Remote Console] button on the BMC Login window.

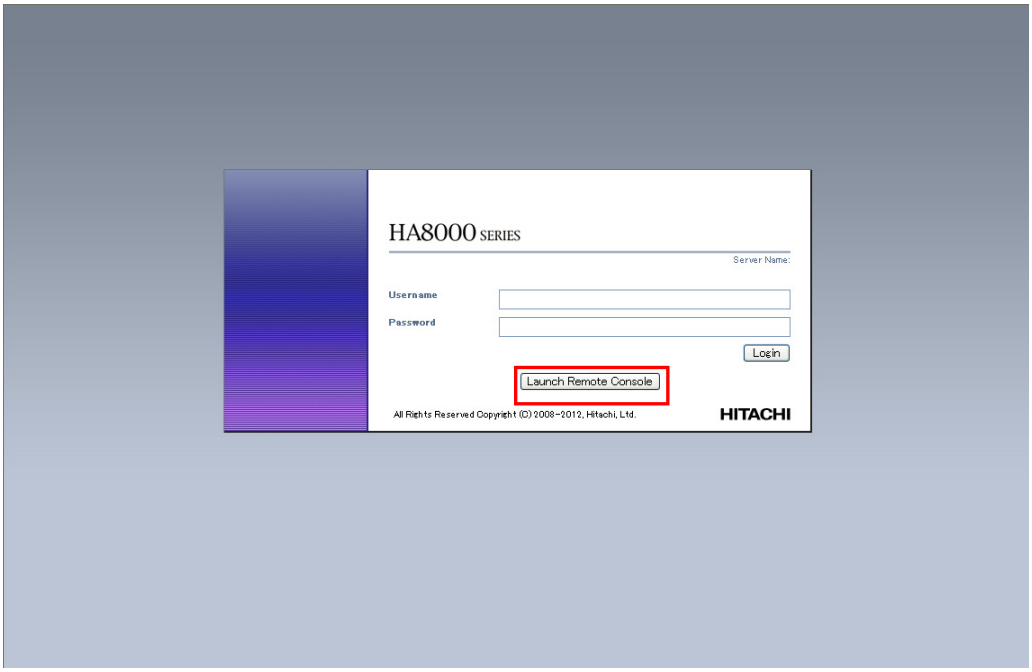

Figure B.1.4-9 BMC Login window 3

(b-2) The Launch Remote Console window is displayed as shown in Figure B.1.4-10. Enter “ceconsl” in [User ID], “cepasswd” in [Password], and then click [Connect] button.

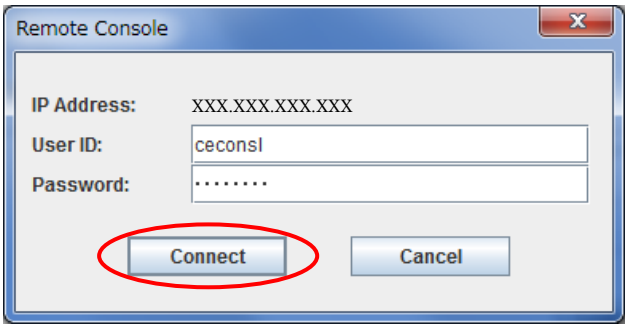

Figure B.1.4-10 Launch Remote Console window 2

NOTE: If the JRE version of the maintenance PC is JRE 7 update21 or later, a security warning may be displayed and the remote console may not be activated.
Refer to “Maintenance Tool ‘1.2.1 Requirements for the maintenance PC’ (MNTT 01-0030).”

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(12) Confirm that the Console window as shown in Figure B.1.4-11 is displayed.

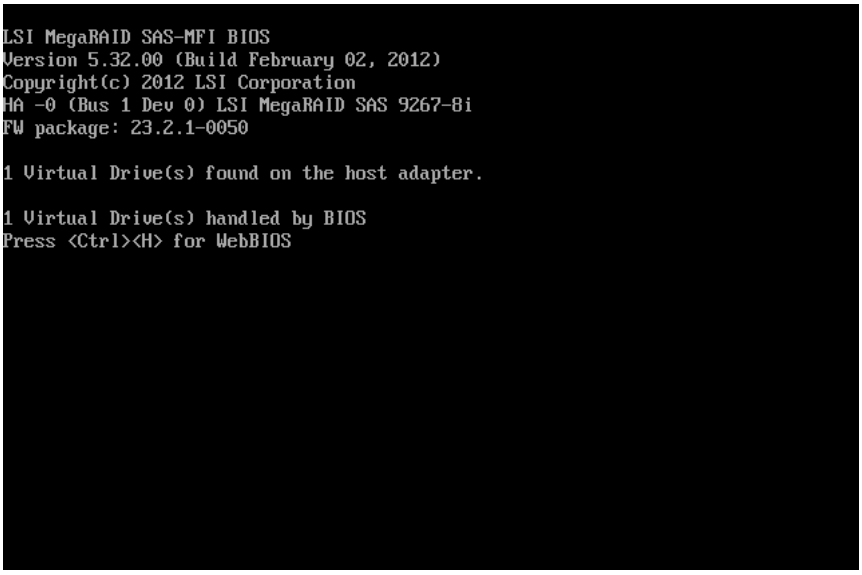

Figure B.1.4-11 Console window 1

NOTE:
- If there is no operation for 15 minutes after login, the user to be logged out automatically. In that case, login again.
- Be careful with keystrokes while using the remote console. The console window will be closed by pressing [Enter] key while holding down [Alt] key.
- To restart while using the remote console, hold down [Alt] key and press [L] key.
- If the window remain black and you cannot see anything on it, click [Video] on the upper console window, and then click [Refresh screen] on the pull-down menu to display the contents output to the console.
- If “LOG: unexpected EOF on client connection” is displayed after “login” in the login screen, press [Enter] key.

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(10) Make sure that Figure B.1.4-12 or Figure B.1.4-13 is displayed. If not displayed, which means either OS is under boot processing / under suspension, or OS has suspended.
If Figure B.1.4-12 has been displayed, go to step (10-1).
If Figure B.1.4-13 has been displayed, go to step (10-2).

(10-1) Press [Enter] key without entering anything in the console window.
Make sure that the same prompt message has been output on the bottom of the login prompt window shown in Figure B.1.4-12.
If the same prompt message is displayed, which means that OS is booing.
If the console window has no response, either OS is hanging up or abnormally stopped.

```
File Operating System (*1)

xxxxxxxx(device-serial-number) login:
```

*1: If the OS version is 3.0.2-XX or earlier, “Hitachi File Storage Linux” is displayed.
Note that “Hitachi File Storage Linux” is not displayed if the version is 3.2.1-XX or later.

Figure B.1.4-12 Login Prompt window

(10-2) Press either [Ctrl] + [F2] key or [Alt] + [F2] key (*) and confirm that the widow has been switched to the login prompt window.
If the window is switched, OS is booting.
If the window is not switched, either OS is hanging up or abnormally stopped.

*: Note that the remote console has the restriction with [Alt] key. Therefore, execute the following three steps when using the remote console.
i Press [Alt] + [z] key and hold [Alt] key down.
ii Press either [F1] or [F2] key solely to switch the window.
iii Press [Alt] + [z] key and release [Alt] key.

```
(Hint: Press Ctrl + F2 to go to the Login screen.) (*1)

xxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

*1: “Hint: Press Alt + F2 to go to the Login screen.” is displayed depending on the OS version.

Figure B.1.4-13 Console window 2

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B.2 BIOS Setting

B.2.1 BIOS Version Checking Procedure

NOTE: Open the console window of KVM or the remote console window, and then execute step (1).
For connecting KVM or the remote console, refer to ‘B.1 Connection and Confirmation of OS Console.’

(1) Refer to “Installation ‘2.1 Procedure for Turning on and off the Power’ (INST 02-0000)”, and then execute the termination of the node.

(2) Start the OS of the node with referring to “Installation ‘2.1 Procedure for Turning on and off the Power’ (INST 02-0000.)”
If “Press <DEL> to enter setup” is shown on the center of the console window during the OS of the node is starting, press [Delete] key.
If [Delete] key could not be pressed, reboot the OS of the node and execute the operation from step (1) again.

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(3) The main menu window is displayed as shown in Figure B.2.1-1.
Write down the version displayed in [BIOS Version].

NOTE: Firmware update is required depending on the displayed version.

If the BIOS version check is for the OS installation, do not proceed to step (4.) Return to the caller of the BIOS version checking procedures and execute the rest of the operations.

If the BIOS version check is for motherboard replacement, select [Save & Exit] and proceed to step (4.)

In the case BMC firmware version check to be performed after the BIOS version check, proceed to 'B.2.2 BMC Firmware Version Checking Procedure (3.)'

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

BIOS Version                xx.xx.xx
Build Date and Time         [MM/DD/YYYY HH:MM:SS]

Memory Information
Total Memory                xxxx MB

►System Information

System Language             [English]

System Date                 [Xxx MM/DD/YYYY]
System Time                 [HH:MM:SS]

Access Level                Administrator

→←:   Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:    Change Opt.
F1:     General Help
F2:     Previous Values
F3:     Optimized Defaults
F4:     Save & Exit
ESC:    Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.1-1 Main Menu window

NOTE: For the detailed operation method, refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]".

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(4) The Save & Exit menu window is displayed as shown in Figure B.2.1-2.
Select [Discard Changes and Exit] and press [Enter] key.

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

Save Changes and Reset
Discard Changes and Exit

Save Options
Save Changes
Discard Changes

Remote Defaults

Boot Override
P4: xxxxx
(Bus xx Dev xx)PCI RAID Adapter
Built-in EFI Shell

→←:   Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:    Change Opt.
F1:     General Help
F2:     Previous Values
F3:     Optimized Defaults
F4:     Save & Exit
ESC:    Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.1-2 Save & Exit Menu window

The Save & Exit confirmation message is displayed as shown in Figure B.2.1-3. Select [Yes] and press [Enter] key. The node will start without rebooting. Return to the caller of the BIOS version checking procedures and execute the rest of the operations.

```
Exit Without Saving

Quit without saving?

Yes        No
```

Figure B.2.1-3 Save & Exit Confirmation message

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B.2.2 BMC Firmware Version Checking Procedure

NOTE: Open the console window of KVM or the remote console window, and then execute step (1).
For connecting and confirming KVM or the remote console, refer to ‘B.1 Connection and Confirmation of OS Console.’

(1) Terminate the OS of the node with reference to “Installation ‘2.1 Procedure for Turning on and off the Power’ (INST 02-0000)”.

(2) Reboot the OS of the node with reference to “Installation ‘2.1 Procedure for Turning on and off the Power’ (INST 02-0000)”.
If “Press <DEL> to enter SETUP” is shown on the center of the console window during the OS of the node is starting, press [Delete] key.
If [Delete] key could not be pressed, reboot the OS of the node and execute the operation from step (1) again.

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(3) The main menu window is displayed as shown in Figure B.2.2-1.
Select [System Information] and press [Enter] key.

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

BIOS Version                xx.xx.xx
Build Date and Time         [MM/DD/YYYY HH:MM:SS]

Memory Information
Total Memory                xxxx MB

▶System Information

System Language             [English]

System Date                 [Xxx MM/DD/YYYY]
System Time                 [HH:MM:SS]

Access Level                Administrator

→←:   Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:    Change Opt.
F1:     General Help
F2:     Previous Values
F3:     Optimized Defaults
F4:     Save & Exit
ESC:    Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.2-1 Main Menu window

NOTE: For the detailed operation methods, refer to “Maintenance Manual Hitachi Compute Rack 220SM [System Unit] Maintenance Manual”.

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(4) The System Information window is displayed as shown in Figure B.2.2-2.
Write down the version displayed in [BMC Version] and press [ESC] key.

NOTE: Firmware update is required depending on the displayed version.

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main

BMC Version                     xx-xx
SDR Version                     xxxxxxxx
MB Version                      x.x.x.xx

System Product Name             HA8000/xxxxx
System Version                  xxxxxxxxxx
System Serial Number
            xxxxxxxxxxxxxxxxxxxx

Board Product Name              xxxxxxx

LAN1 MAC Address                xx-xx-xx-xx-xx
LAN2 MAC Address                xx-xx-xx-xx-xx
BMC MAC Address                 xx-xx-xx-xx-xx

Remote KVM                      xxxxxxxxxxxx
HA Monitor                      xxxxxxxxxxxx

→←:   Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:    Change Opt.
F1:     General Help
F2:     Previous Values
F3:     Optimized Defaults
F4:     Save & Exit
ESC:    Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.2-2 System Information window

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(5) Select [Save & Exit] to return to the main menu window. The Save & Exit menu window is displayed as shown in Figure B.2.2-3. Select [Discard Changes and Exit] and press [Enter] key.

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

Save Changes and Reset
Discard Changes and Exit

Save Options
Save Changes
Discard Changes

Remote Defaults

Boot Override
P4: xxxxx
(Bus xx Dev xx)PCI RAID Adapter
Built-in EFI Shell

→←:   Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:    Change Opt.
F1:     General Help
F2:     Previous Values
F3:     Optimized Defaults
F4:     Save & Exit
ESC:    Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.2-3 Save & Exit Menu window

The Save & Exit confirmation message is displayed as shown in Figure B.2.2-4. Select [Yes] and press [Enter] key. The node will start without rebooting. Return to the caller of the BMC firmware version checking procedures and execute the rest of the operations.

```
Exit Without Saving

Quit without saving?

Yes        No
```

Figure B.2.2-4 Save & Exit Confirmation message

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B.2.3 BOOT Priority Order

NOTE:
- Open the console window of KVM or the remote console window, and then execute step (1). For connecting and confirming KVM or the remote console, refer to ‘B.1 Connection and Confirmation of OS Console.’
- Connecting the node with a external DVD-ROM drive is required before pressing the power switch. For how to connect, refer to ‘A.2.1 Front side.’

(1) Stop the OS of the node with referring to “Installation ‘2.1 Procedure for Turning on and off the Power’ (INST 02-0000)”. If the Power lamp is turned off, execute the procedure step (2). When the main menu window is already displayed, proceed to step (3).

(2) Start the OS of the node with referring to “Installation ‘2.1 Procedure for Turning on and off the Power’ (INST 02-0000)”.

(3) If “Press <DEL> to enter setup” is displayed on the center of the console window while the OS of the node is starting up, press [Delete] key.
If [Delete] key cannot be pressed, If [Delete] key cannot be pressed, execute from step (1) again.

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(4) The main menu window is displayed as shown in Figure B.2.3-1.
Select [Boot.]

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

BIOS Version                xx.xx.xx                  →←:  Select Screen
Build Date and Time         [MM/DD/YYYY HH:MM:SS]     ↑ ↓ :  Select Item
                                                      Enter:  Select
Memory Information                                    +/-:  Change Opt.
Total Memory                xxxx MB                   F1:  General Help
                                                      F2:  Previous Values
►System Information                                   F3:  Optimized Defaults
                                                      F4:  Save & Exit
System Language             [English]                 ESC:  Exit

System Date                 [Xxx MM/DD/YYYY]
System Time                 [HH:MM:SS]

Access Level                Administrator

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.3-1 Main Menu window

NOTE: For the detailed operation method of BIOS Setup Utility, refer to “Maintenance Manual Hitachi Compute Rack 220SM [System Unit]”.

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(5) The boot menu window is displayed as shown in Figure B.2.3-2.
Check that the items displayed under [Boot Option Priorities] are listed as the order shown in Figure B.2.3-2.
If the displayed order is different from Figure B.2.3-2, select [Boot Option #x] of which the order is different and press [Enter] to change the order.
If either or both [xxxxxxxxxxxxxxxx] (*) (enable DVD-ROM drive) and [(Bus xx Dev xx)PCI ...] (enable Disk boot) are not displayed as options when you press [Boot Option #x], they are disabled. Enable them by referring to step (a) Enable DVD-ROM drive and step (b) Enable disk boot, and then change the display order of [Boot Option #x.]

NOTE:
- When entering characters in the BIOS setup utility window, the keyboard layout is recognized as the 101 series Keyboard (QWERTY based layout).
- [xxxxxxxxxxxxxxxx] (enable DVD-ROM drive) may not be displayed if there is a failure in the DVD-ROM drive or the USB cable and/or the port which connect the node and the external DVD-ROM drive.

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

Boot Configuration
Setup Prompt Timeout          1
Boot Numlock State            [On]

Quiet Boot                    [Disabled]

Boot Option Priorities
Boot Option #1                [xxxxxxxxxxxxxxxx]
Boot Option #2                [(Bus xx Dev xx)PCI ...]
Boot Option #3                [Built-in EFI Shell]

CD\DVD ROM Drive BBS Priorities
Hard Drive BBS Priorities

→←:   Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:    Change Opt.
F1:     General Help
F2:     Previous Values
F3:     Optimized Defaults
F4:     Save & Exit
ESC:    Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.3-2 Boot Menu window

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(a) Enable DVD-ROM drive
Select [CD/DVD ROM Drive BBS Priorities] and press [Enter] key. The DVD-ROM drive boot setting window is displayed as shown in Figure B.2.3-4.

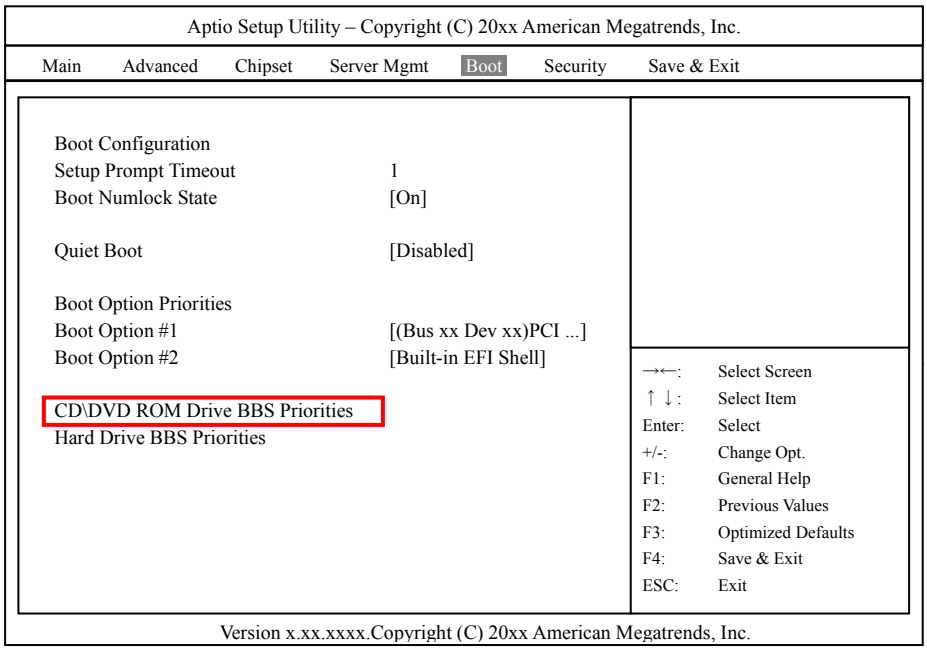

Figure B.2.3-3 Boot Menu window 2

Select [Boot Option #1] and press [Enter] key.

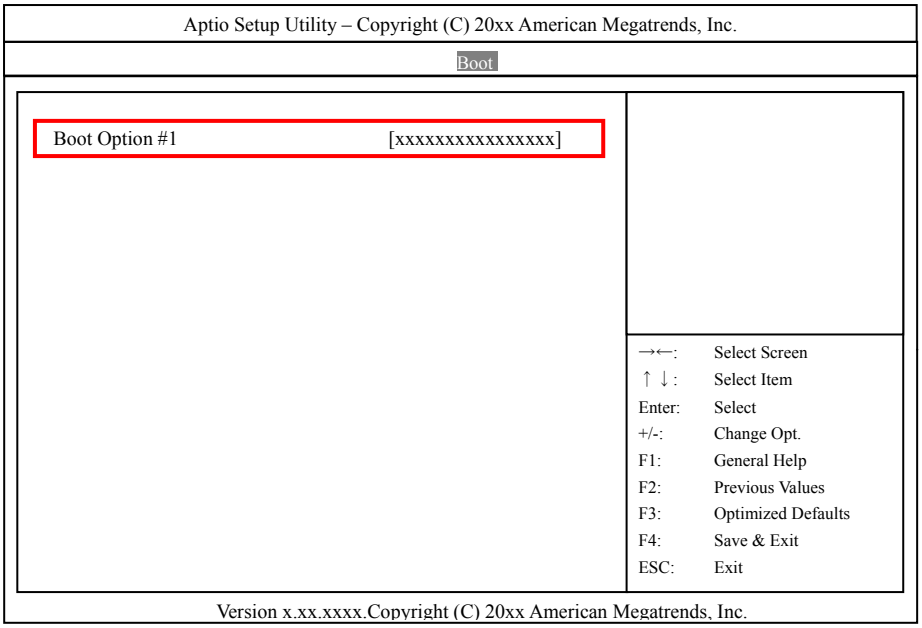

Figure B.2.3-4 DVD-ROM Drive Boot Setting window

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A window as shown in Figure B.2.3-5 is displayed. Select [xxxxxxxxxxxxxxxx], press [Enter] key and then press [ESC] key to return to the boot menu window.

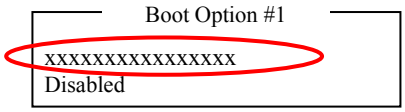

Figure B.2.3-5 Boot Option Selecting window 1

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(b) Enable disk boot
Select [Hard Drive BBS Priorities] and press [Enter] key. The disk boot setting window is displayed as shown in Figure B.2.3-7.

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

Boot Configuration
Setup Prompt Timeout          1
Boot Numlock State            [On]

Quiet Boot                    [Disabled]

Boot Option Priorities
Boot Option #1                [xxxxxxxxxxxxxxxx]
Boot Option #2                [Built-in EFI Shell]

CD\DVD ROM Drive BBS Priorities
Hard Drive BBS Priorities

→←:   Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:   Change Opt.
F1:    General Help
F2:    Previous Values
F3:    Optimized Defaults
F4:    Save & Exit
ESC:   Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.3-6 Boot Menu window 3

Select [Boot Option #1] and press [Enter] key.

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Boot

Boot Option #1                [(Bus xx Dev xx)PCI ...]

→←:   Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:   Change Opt.
F1:    General Help
F2:    Previous Values
F3:    Optimized Defaults
F4:    Save & Exit
ESC:   Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.3-7 Disk Boot Setting window

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A window as shown in Figure B.2.3-8 is displayed. Select [(Bus xx Dev xx)PCI ...], press [Enter] key and then press [ESC] key to return to the boot menu window.

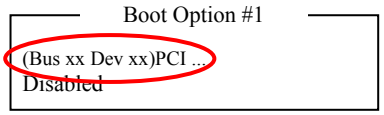

Figure B.2.3-8 Boot Option Selecting window 2

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(6) Select [Save & Exit] in the boot menu window as shown in Figure B.2.3-2.
The Save & Exit menu window is displayed as shown in Figure B.2.3-9.

```
Aptio Setup Utility – Copyright(C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

Save Changes and Reset
Discard Changes and Exit

Save Options
Save Changes
Discard Changes

Restore Defaults

Boot Override
xxxxxxxxxxxxxxxx
Built-in EFI Shell
(BUS xx Dev xx)PCI RAID Adapter

→←:      Select Screen
↑ ↓ :    Select Item
Enter :  Select
+/- :    Change Opt.
F1:      General Help
F2:      Previous Values
F3:      Optimized Defaults
F4:      Save & Exit
ESC:     Exit

Version x.xx.xxxx. Copyright(C) 20xx American Megatrends, Inc.
```

Figure B.2.3-9 Save & Exit Menu window

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(7) The procedure differs whether the setting was changed in step (5) or not.

(a) If the setting was changed in step (5), select [Save Changes and Reset] and press [Enter] key. The Save & Exit confirmation message 1 is displayed as shown in Figure B.2.3-10.
Select [Yes] and press [Enter] key to reboot the node.

(b) If the setting was not changed in step (5), select [Discard Changes and Exit] and press [Enter] key. The Save & Exit confirmation message 2 is displayed as shown in Figure B.2.3-11.
Select [Yes] and press [Enter] key, and the node will start without rebooting.

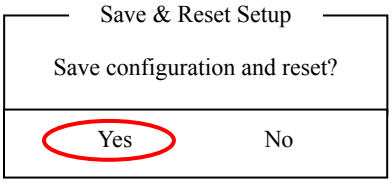
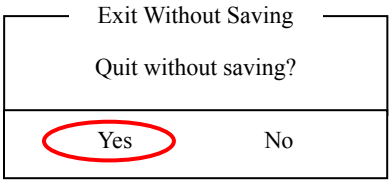


Figure B.2.3-10 Save & Exit Confirmation message 1



図B.2.3-11 Save & Exit Confirmation message 2

(10) Return to the caller of the BOOT priority order and execute the rest of the operations.

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B.2.4 Set the Time in BIOS

Set the time in BIOS from the main menu window.

To obtain the time to enter, it is required to display "Set Up 'Figure 9.1-7 "Date and Time" window 4' (SETUP 09-0030)" or run the timeget-u command on the other side node in advance.

(1) Start the node. When "Press <DEL> to enter setup" is displayed on the center of the console window, press [Delete] key.
If [Delete] key cannot be pressed, reboot the node and then execute from step (1) again.
When the main menu window is already displayed, proceed to step (2).

(2) Select [System Time] from the Figure B.2.4-1 Main Menu Window, and then manually enter the time that you obtained at "Set Up '9.1 UTC-based Time Setting (1) Acquiring the UTC (Universal Coordinated Time)' (SETUP 09-0000.)"
The tolerance level of this time setting is within 10 seconds of the time displayed in the maintenance PC.

(3) Select [System Date] from the Figure B.2.4-1 Main Menu Window, and then manually enter the UTC date that you obtained at step (2).

(4) Select [Save & Exit] in the main menu window as shown in Figure B.2.4-1.

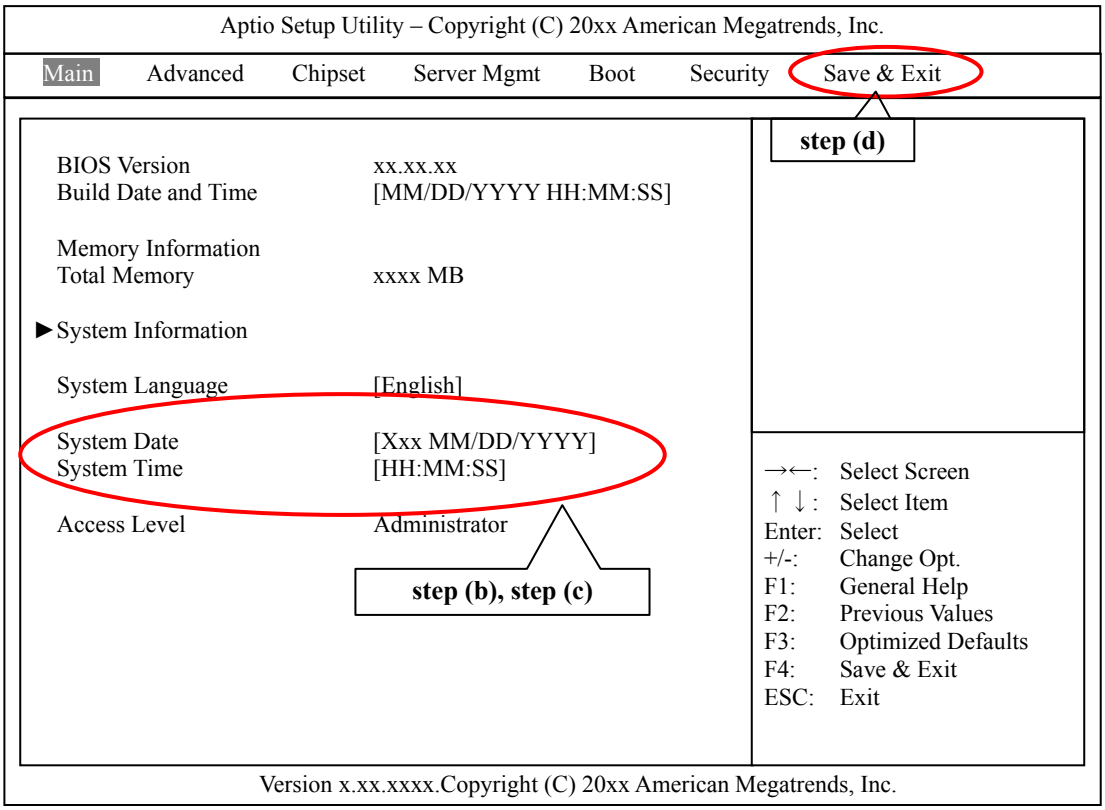

Figure B.2.4-1 Main Menu window

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(5) The Save & Exit menu window is displayed as shown in Figure B.2.4-2.
Select [Save Changes and Reset] and press [Enter] key. The Save & Exit confirmation message is displayed as shown in Figure B.2.4-3. Select [Yes] and press [Enter] key to reboot the node.

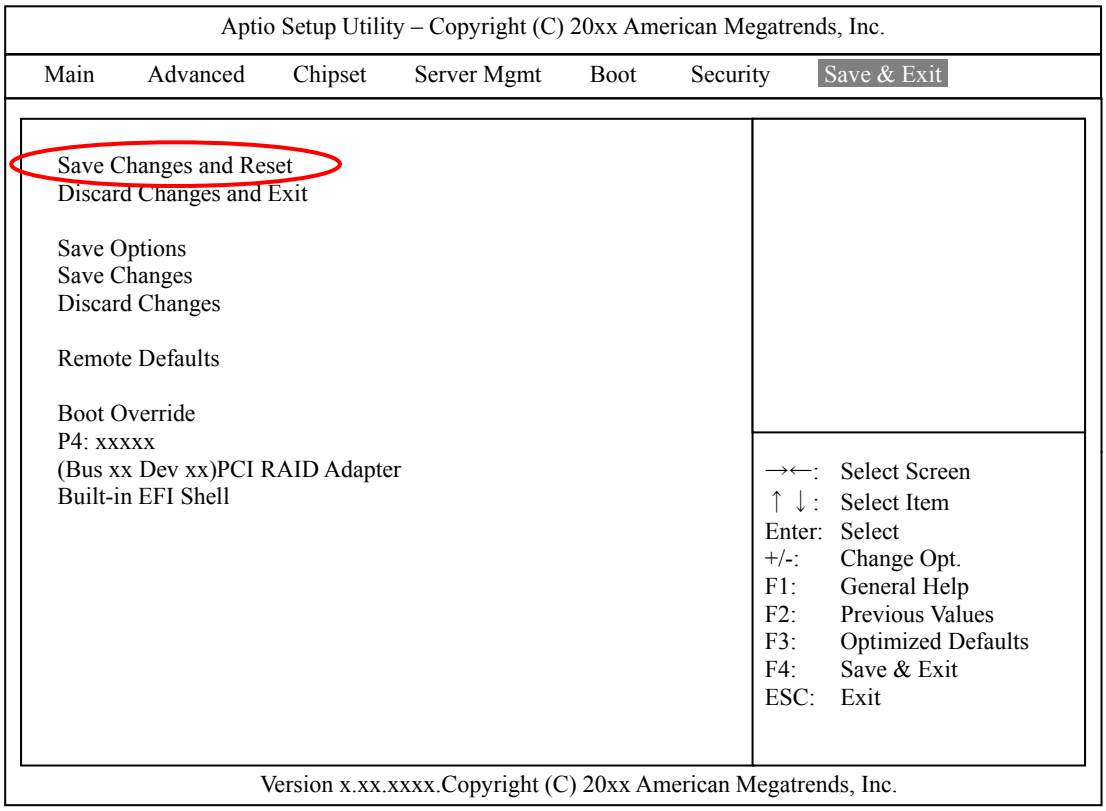

Figure B.2.4-2 Exit Menu window

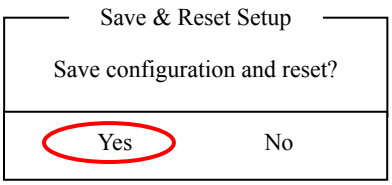

Figure B.2.4-3 Save & Exit Confirmation message

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B.2.5 BMC Setting Procedure

The setting procedure of BMC is unnecessary for the model: CR220SM.

Return to the caller of the BMC setting procedures and execute the rest of the operations.

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B.2.6 RAID Controller Setting

B.2.6.1 Virtual disk setting confirmation

NOTE: Open the console window of KVM or the remote console window, and then execute step (1.)
For connecting KVM or the remote console, refer to 'B.1 Connection and Confirmation of OS Console.'

(1) Press the power switch to turn on the power of the node.
For the location of the power switch, refer to 'A.2.1 Front side.'

(2) Some time after the node starts up, the virtual disk setting login window is displayed as shown in Figure B.2.6.1-1. Press [Ctrl]+[H] key within 5 seconds.
If [Ctrl]+[H] key cannot be pressed, proceed to step (3.) If pressed, proceed to step (4.)

```
LSI MegaRAID SAS-MFI BIOS
Version x.xx.xx (Build xxxx xx, xxxx)
Copyright (c) xxxx LSI Corporation
HA -0 (Bus xx Dev x) LSI MegaRAID SAS xxxxxxx
FW package: x.x.x-xxxx

x Virtual Drive(s) found on the host adapter.

x Virtual Drive(s) handled by BIOS
Press <Ctrl><H> for WebBIOS
```

Figure B.2.6.1-1 Virtual Disk Setting Login window

(3) If [Ctrl]+[H] key cannot be pressed, reboot the OS of the node and then execute from step (2) again.

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(4) The adapter selection window is displayed as shown in Figure B.2.6.1-2.
Press [Ctrl] key on the left side of the keyboard once and click [Start.]

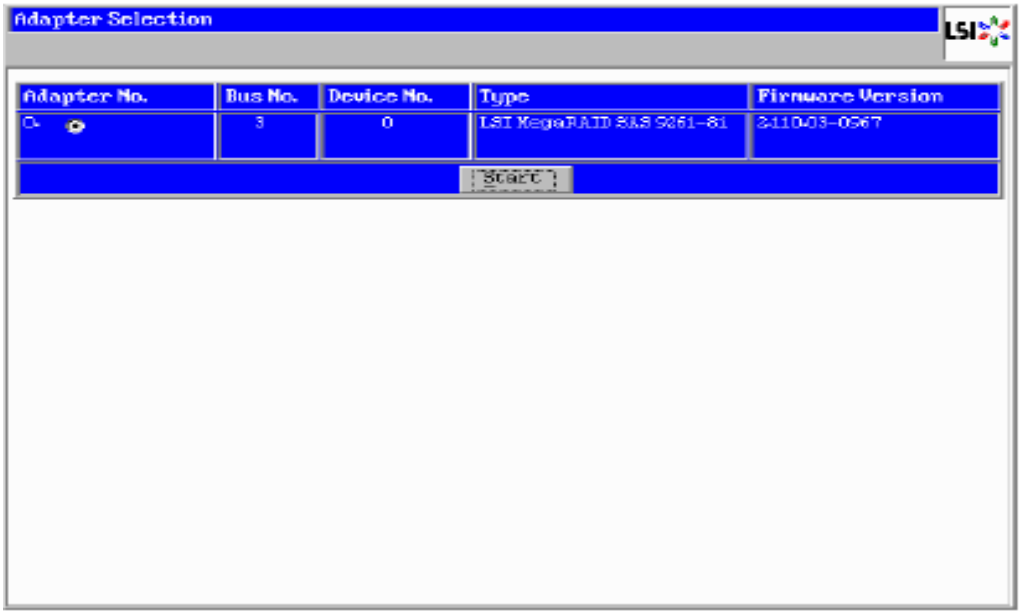

Figure B.2.6.1-2 Adapter Selection window

NOTE: The keyboard and mouse may not work properly if you do not press [Ctrl] key on the left side of the keyboard.
Hereafter, when the keyboard or mouse do not work in [MegaRAID WebBIOS] operation, press [Ctrl] key on the left side of the keyboard once.

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(5) The main menu window is displayed as shown in Figure B.2.6.1-3.
Confirm “RAIDX” (X: any of 1/5/6/10) in [Drive Group:1, RAIDX] which is shown on the right side. That is the current RAID level.
When the displayed window is [Physical View], the thick-framed part in the figure will be displayed as [Logical View]. Press [Enter] key to switch to [Logical View] window.

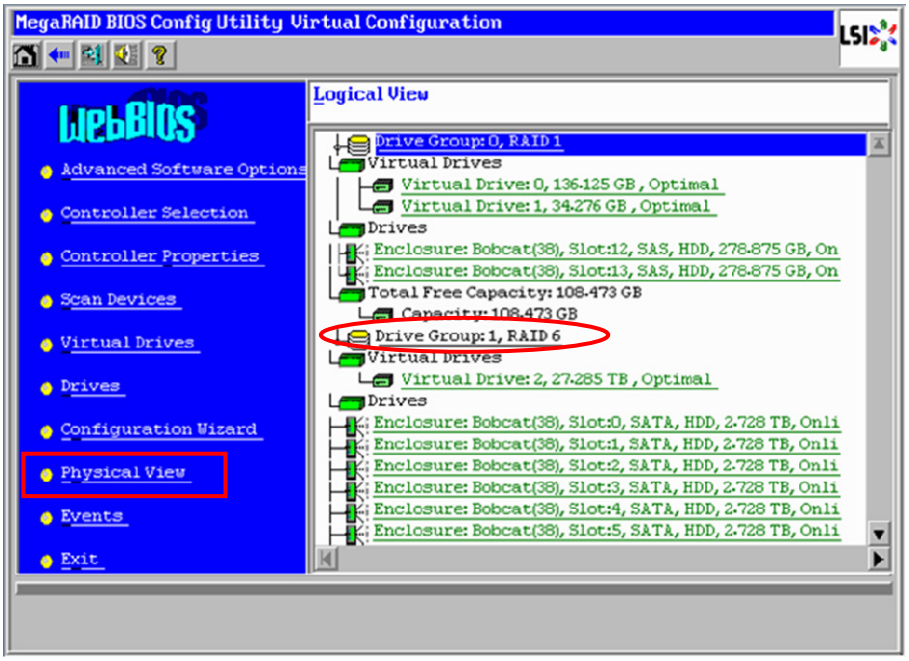

Figure B.2.6.1-3 Main Menu window

(6) Click [Exit] under the menu on the left side in the main menu window as shown in Figure B.2.6.1-4 and press [Enter] key.

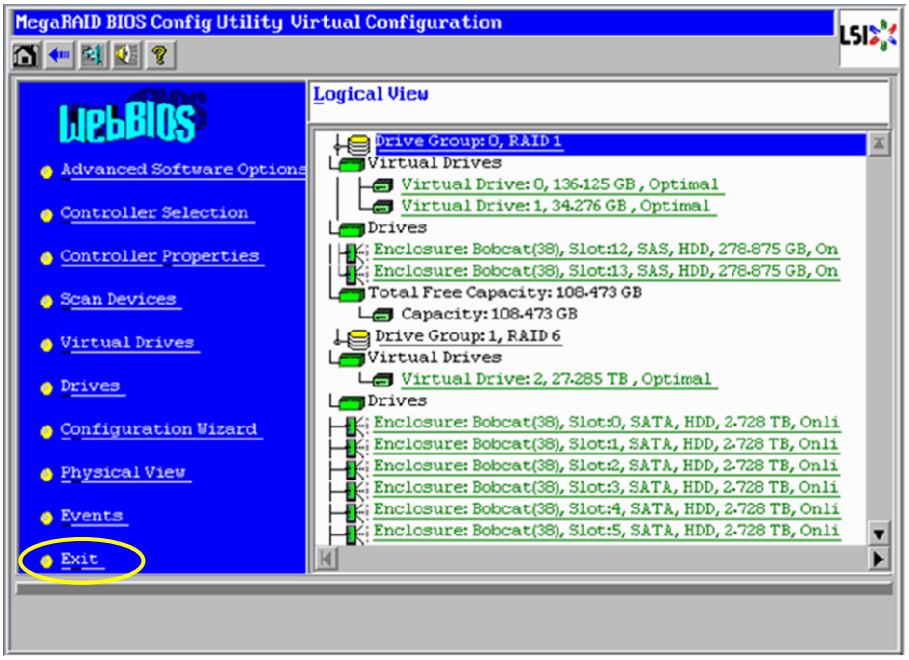

Figure B.2.6.1-4 Main Menu window

Copyright © 2012, Hitachi, Ltd.

(7) The exit confirmation window is displayed as shown in Figure B.2.6.1-5.
Click [Yes] button.

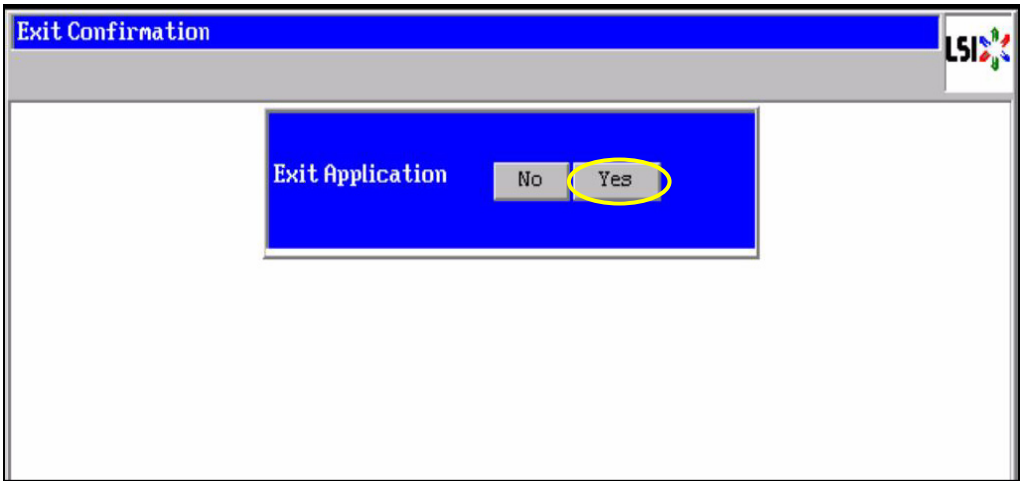

Figure B.2.6.1-5 Exit Confirmation window

(8) The reset page window is displayed as shown in Figure B.2.6.1-6. Press the power switch to turn off the power of the node.
For the location of the power switch, refer to ‘A.2.1 Front side’.

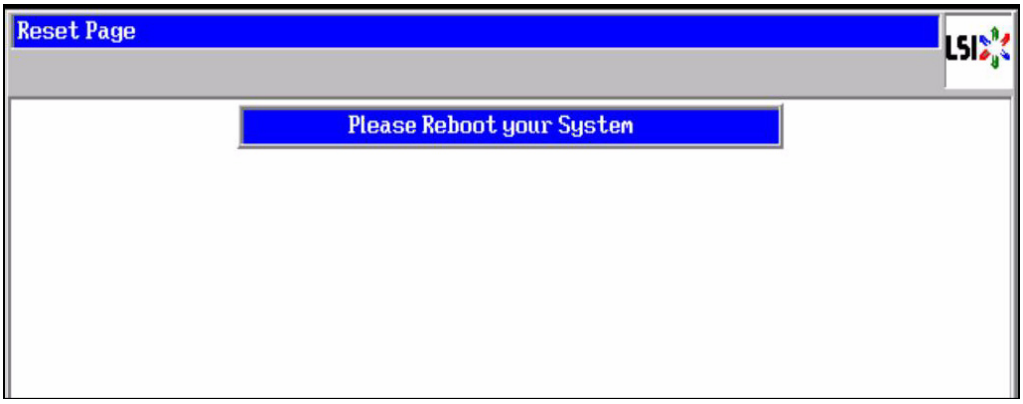

Figure B.2.6.1-6 Reset Page window

(9) After completing the confirmation of the virtual disk, return to the caller and execute the rest of the procedures.

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B.2.6.2 Virtual disk setting procedure

The setting procedure of RAID controller is unnecessary for the model: CR220SM.

Return to the caller of RAID controller setting procedures and execute the rest of the operations.

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B.2.7 Confirmation of CPU Virtualization Support Mechanism

Verify the CPU virtualization support mechanism from the main menu window.

(a) Terminate the OS of the node with reference to "Installation '2.1 Procedure for Turning on and off the Power' (INST 02-0000)". If the node is stopped already, proceed to step (b).

(b) Reboot the OS of the node with reference to "Installation '2.1 Procedure for Turning on and off the Power' (INST 02-0000)", and if "Press <DEL> to enter setup" is displayed on the center of the console window while the OS of the node is starting, press [Delete] key.
If [Delete] key could not be pressed, reboot the OS of the node and execute the operation from step (b) again.

(c) The main menu window is displayed as shown in Figure B.2.7-1. Select [Advanced.]

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

BIOS Version                xx.xx.xx
Build Date and Time         [MM/DD/YYYY HH:MM:SS]

Memory Information
Total Memory                xxxx MB

►System Information

System Language             [English]

System Date                 [Xxx MM/DD/YYYY]
System Time                 [HH:MM:SS]

Access Level                Administrator

→←:  Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:  Change Opt.
F1:  General Help
F2:  Previous Values
F3:  Optimized Defaults
F4:  Save & Exit
ESC:  Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.7-1 Main Menu window

NOTE: For the details about the operation method of BIOS Setup Utility, refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]".

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(d) The advanced menu window is displayed as shown in Figure B.2.7-2. Select [CPU Configuration] and press [Enter] key.

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

  LAN1 PXE OpROM                [Disabled]
  LAN2 PXE OpROM                [Disabled]
  LAN3 PXE OpROM                [Disabled]
  LAN4 PXE OpROM                [Disabled]
► PCI Subsystem settings
► Trusted Computing
► WHEA Configuration
► CPU Configuration
► Runtime Error Logging
► SATA Configuration
► Intel TXT(LT-SX) Configuration
► USB Configuration
► Super IO Configuration
► Serial Port Console Redirection

→←:   Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:    Change Opt.
F1:     General Help
F2:     Previous Values
F3:     Optimized Defaults
F4:     Save & Exit
ESC:    Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.7-2 Advanced Menu window

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(e) The CPU advanced function setting sub menu window is displayed as shown in Figure B.2.7-3. Check that [Disabled] is displayed as [Hyper-threading.]
When [Disabled] is displayed as [Hyper-threading], press [ESC] key and proceed to step (f.)
When [Enabled] is displayed as [Hyper-threading], select [Hyper-threading] and change it to [Disabled.] After that, press [ESC] key and proceed to step (f.)

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

CPU Configuration

►Socket 1 CPU Information
 Socket 2                          Not Present

 Hyper-threading                   [Disabled]
 Active Processor Cores            [All]
 Execute Disable Bit               [Enabled]
 Hardware Prefetcher               [Enabled]
 Adjacent Cache Line Prefetch      [Enabled]
 DCU Streamer Prefetch             [Enabled]
 DCU IP Prefetch                   [Enabled]
 Intel Virtualization Technology   [Enabled]
 Discrete MTRR Allocation          [Enabled]
►CPU Power Management Configuration

→←:   Select Screen
↑ ↓:  Select Item
Enter: Select
+/-:   Change Opt.
F1:    General Help
F2:    Previous Values
F3:    Optimized Defaults
F4:    Save & Exit
ESC:   Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.7-3 CPU Advanced Function Setting Sub Menu window

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(f) The advanced menu window is displayed as shown in Figure B.2.7-4.
Select [Save & Exit.]

```
Aptio Setup Utility – Copyright(C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

  LAN1 PXE OpROM                [Disabled]
  LAN2 PXE OpROM                [Disabled]
  LAN3 PXE OpROM                [Disabled]
  LAN4 PXE OpROM                [Disabled]
► PCI Subsystem settings
► Trusted Computing
► WHEA Configuration
► CPU Configuration
► Runtime Error Logging
► SATA Configuration
► Intel TXT(LT-SX) Configuration
► USB Configuration
► Super IO Configuration
► Serial Port Console Redirection

→←:      Select Screen
↑ ↓ :    Select Item
Enter :  Select
+/- :    Change Opt.
F1:      General Help
F2:      Previous Values
F3:      Optimized Defaults
F4:      Save & Exit
ESC:     Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.7-4 Advanced Menu window

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(g) The Save & Exit menu window is displayed as shown in Figure B.2.7-5.
The procedure differs whether the setting was changed in step (e) or not.
If the setting was changed in step (e), select [Save Changes and Reset] and press [Enter] key.
The Save & Exit confirmation message 1 is displayed as shown in Figure B.2.7-6. Select [Yes] and press [Enter] key to reboot the node.
If the setting was not changed in step (e), select [Discard Changes and Exit] and press [Enter] key.
The Save & Exit confirmation message 2 is displayed as shown in Figure B.2.7-7.
Select [Yes] and press [Enter] key. The node will start without rebooting.

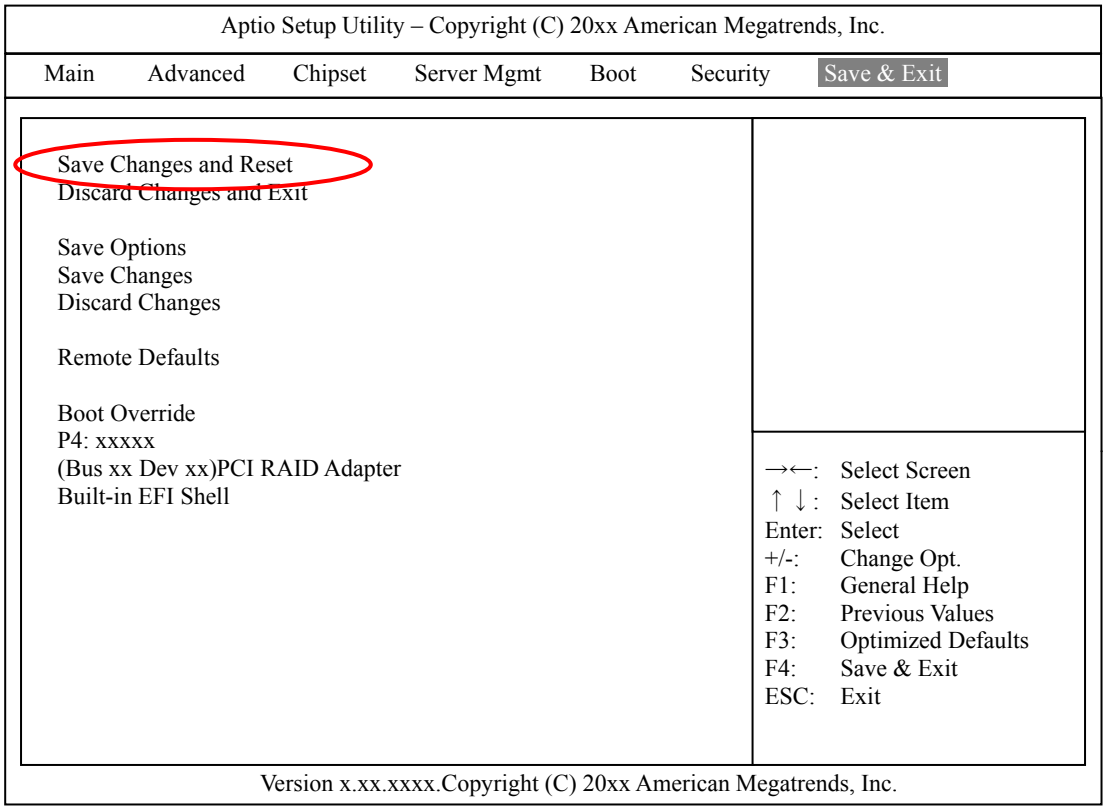

Figure B.2.7-5 Save & Exit Menu window

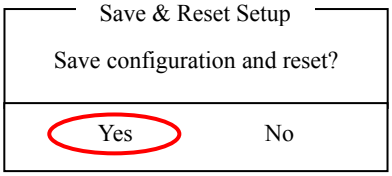

Figure B.2.7-6 Save & Exit Confirmation message 1

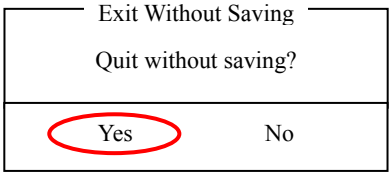

Figure B.2.7-7 Save & Exit Confirmation message 2

(h) Return to the caller and execute the rest of the operations.

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B.2.8 Virtual Drive Consistency Checking Procedure

NOTE: Open the console window of KVM, and then execute step (1.)
For connecting and confirming KVM, refer to 'B.1 Connection and Confirmation of OS Console.'

(1) Press the power switch to turn on the power of the node.
For the location of the power switch, refer to 'A.2.1 Front side.'

(2) Some time after the node starts up, the virtual disk setting login window is displayed as shown in Figure B.2.8-1. Press [Ctrl]+[H] key within 5 seconds.
If [Ctrl]+[H] key cannot be pressed, proceed to step (3.) If pressed, proceed to step (4.)

```
LSI MegaRAID SAS-MFI BIOS
Version x.xx.xx (Build xxxx xx, xxxx)
Copyright (c) xxxx LSI Corporation
HA -0 (Bus xx Dev x) LSI MegaRAID SAS xxxxxxx
FW package: x.x.x-xxxx

x Virtual Drive(s) found on the host adapter.

x Virtual Drive(s) handled by BIOS
Press <Ctrl><H> for WebBIOS
```

Figure B.2.8-1 Virtual Disk Setting Login window

(3) If [Ctrl]+[H] key cannot be pressed, reboot the OS of the node and then execute from step (2) again.

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(4) The adapter selection window is displayed as shown in Figure B.2.8-2.
Press [Ctrl] key on the left side of the keyboard once and click [Start.]

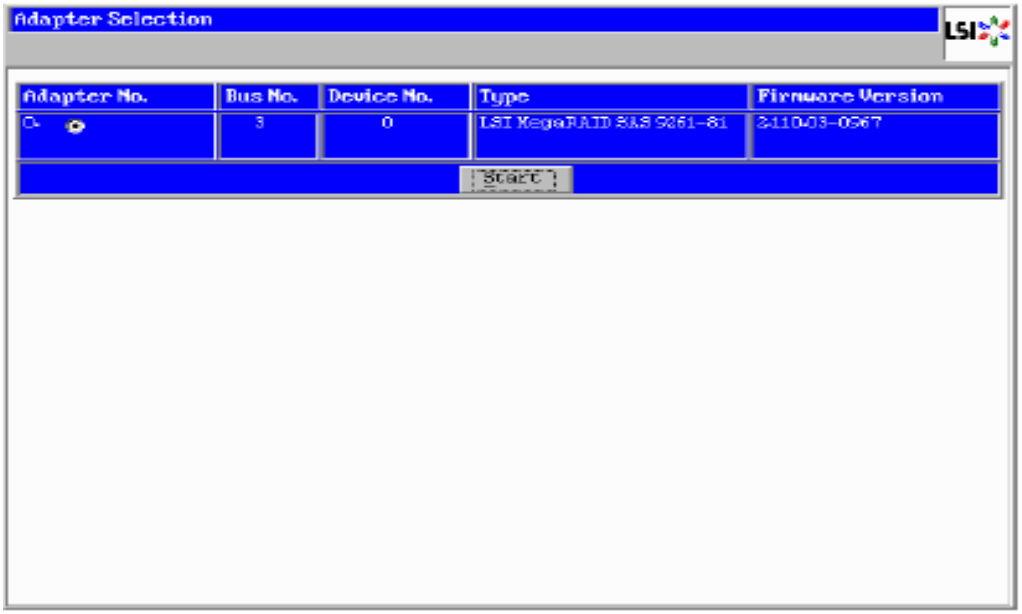

Figure B.2.8-2 Adapter Selection window

NOTE: The keyboard and mouse may not work properly if you do not press [Ctrl] key on the left side of the keyboard.
Hereafter, when the keyboard or mouse do not work in [MegaRAID WebBIOS] operation, press [Ctrl] key on the left side of the keyboard once.

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(5) The main menu window is displayed as shown in Figure B.2.8-3.
Click [Controller Properties] on the left side menu (the thick-framed part in the figure) to switch to [Controller Properties] window.

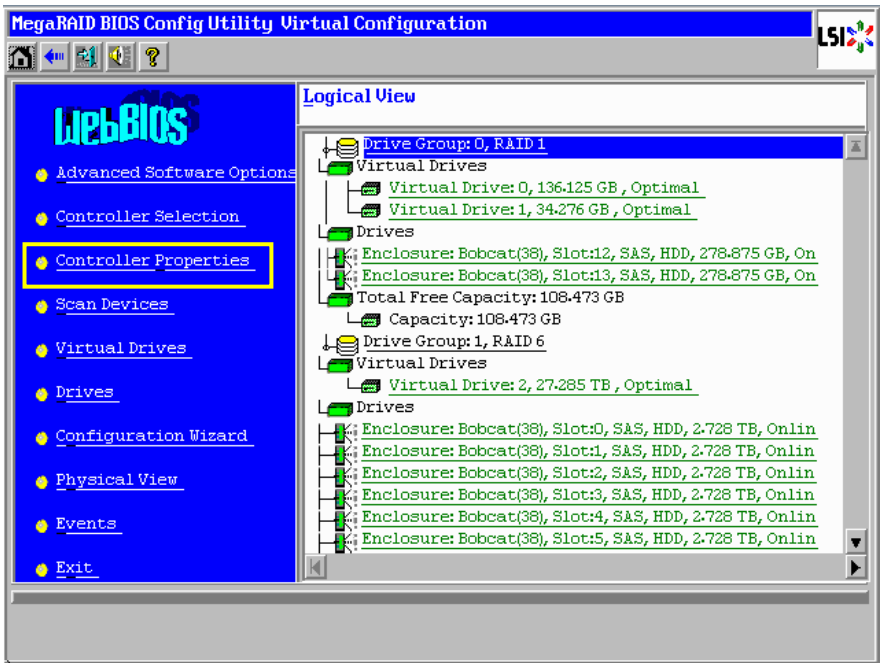

Figure B.2.8-3 Main Menu window

(6) The config information window (1) is displayed as shown in Figure B.2.8-4.
Click [Next] button.

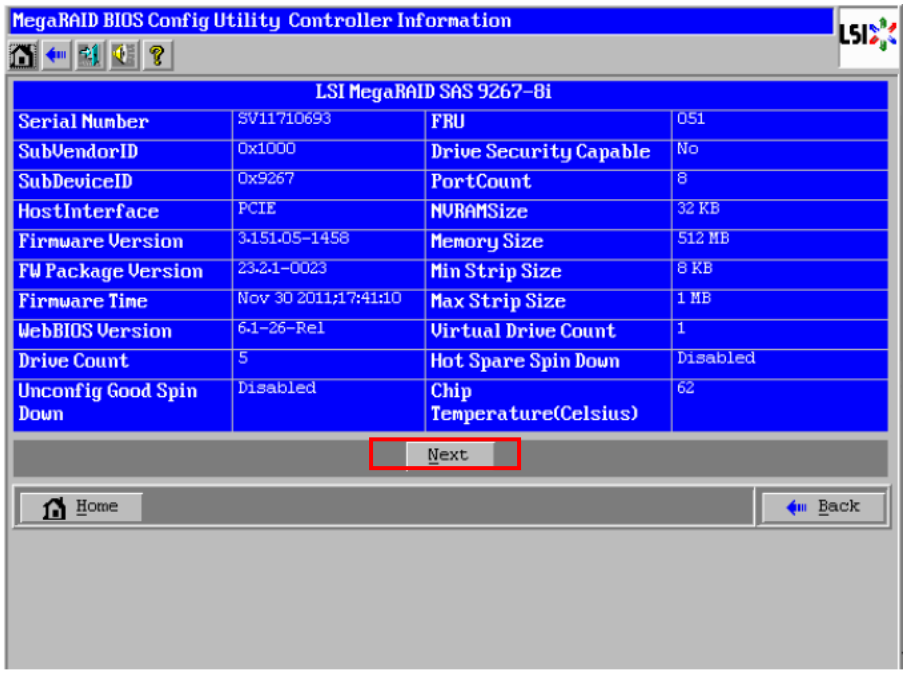

Figure B.2.8-4 Config Information window (1)

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(7) The config information window (2) is displayed as shown in Figure B.2.8-5.
Click [Next] button.

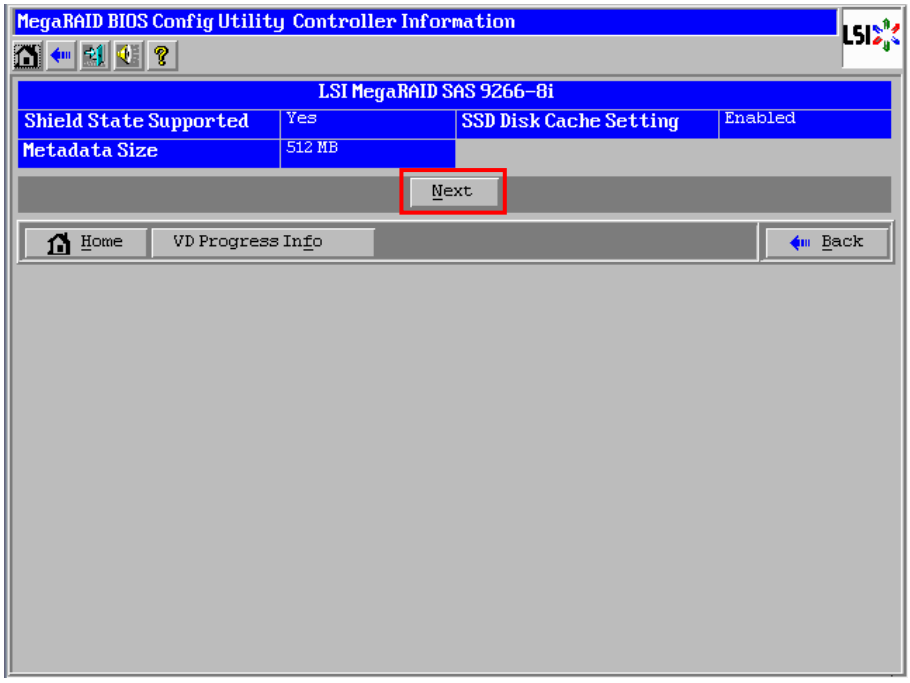

Figure B.2.8-5 Config Information window (2)

(8) The config information window (3) is displayed as shown in Figure B.2.8-6.
Click [Next] button.

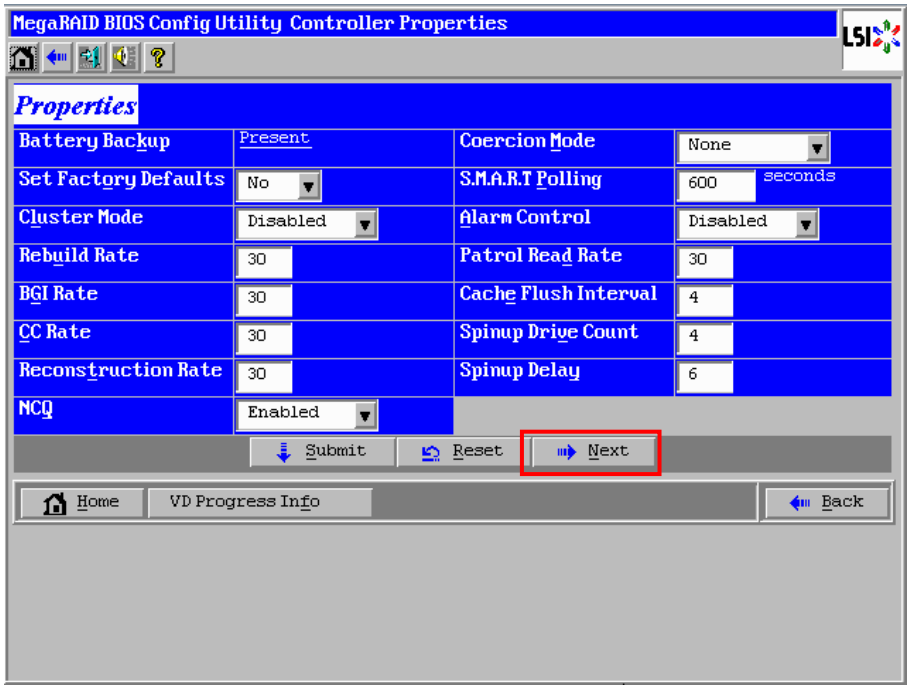

Figure B.2.8-6 Config Information window (3)

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(9) The config information window (4) is displayed as shown in Figure B.2.8-7.
Check that [Yes] is set as [Stop CC On Error.]
When it is other than [Yes], select [Yes] from the drop-down list.
After that, click [Home] button.

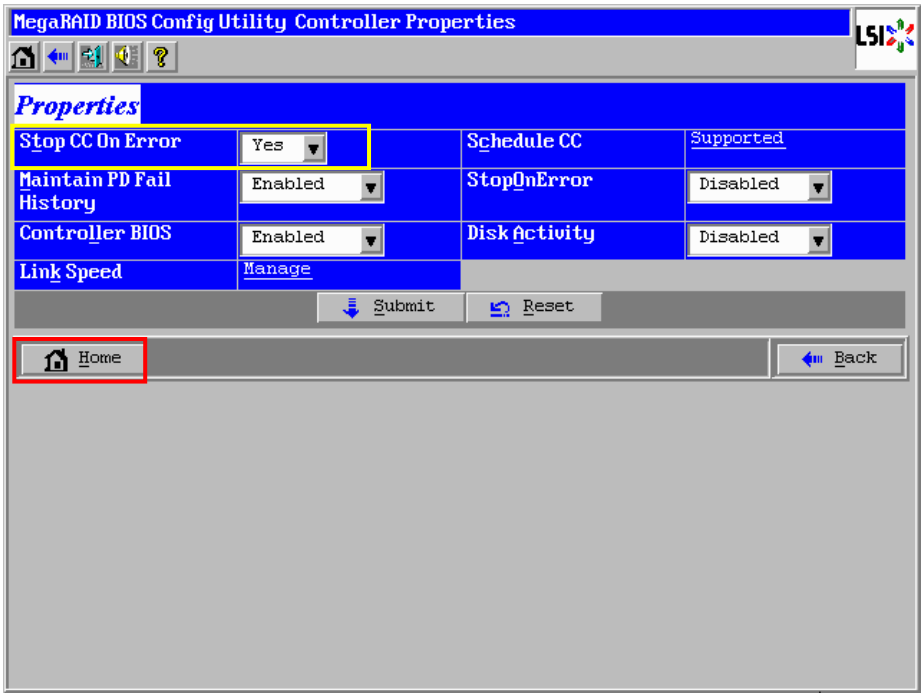

Figure B.2.8-7 Config Information window (4)

(10) The main menu window is displayed as shown in Figure B.2.8-8.
Click [Virtual Drives] on the left side menu (the thick-framed part in the figure) to switch to [Virtual Drives] window.

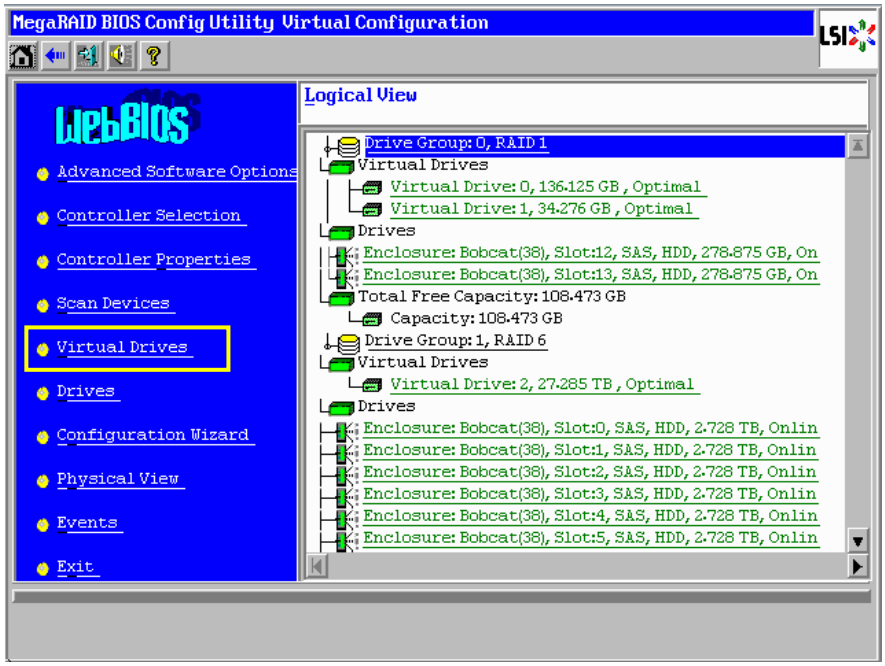

Figure B.2.8-8 Main Menu window

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(11) Select a virtual drive to execute consistency checking from the upper right list on the virtual drives window (1) as shown in Figure B.2.8-9, check [Properties], and then click [Go] button.

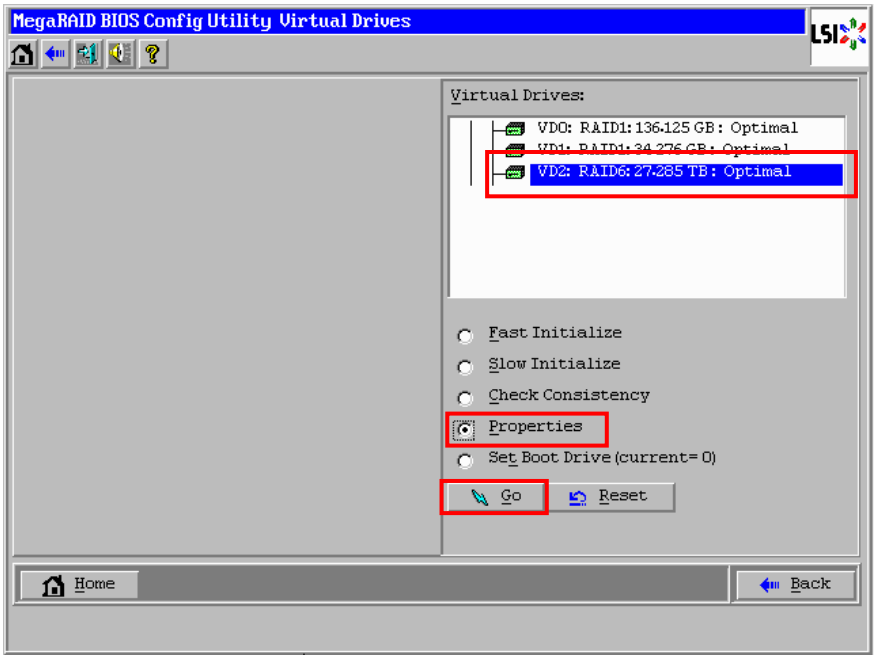

Figure B.2.8-9 Virtual Drives window (1)

(12) The virtual drive window (2) is displayed as shown in Figure B.2.8-10.
Check [CC] option in [Operations] and click [Go] button to start the virtual drive consistency checking.

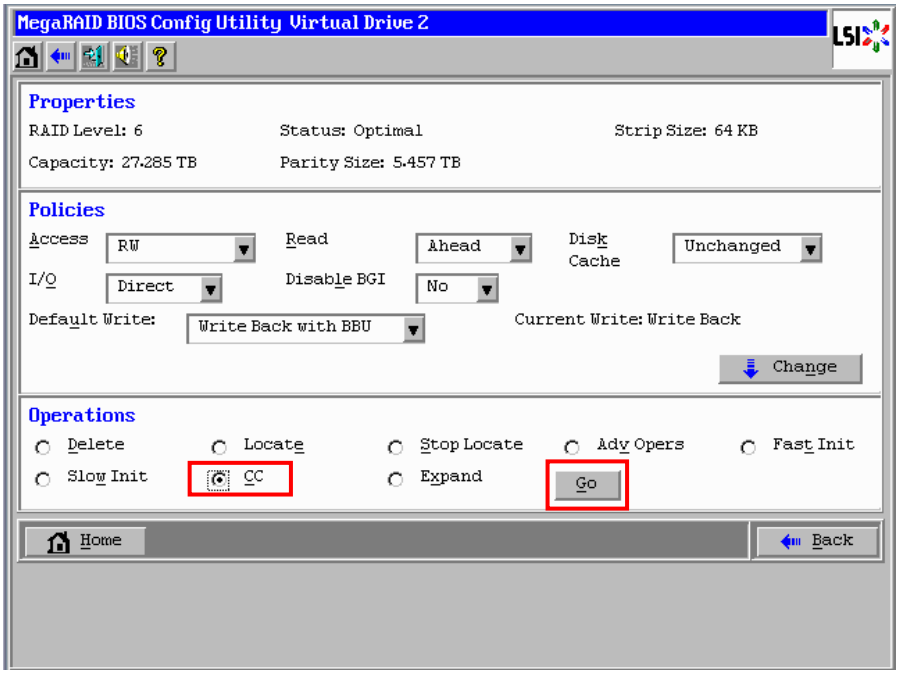

Figure B.2.8-10 Virtual Drive window (2)

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(13) The virtual drive window (2) is displayed as shown in Figure B.2.8-11.
Click [Home] button to return to the main menu window as shown in step (5).

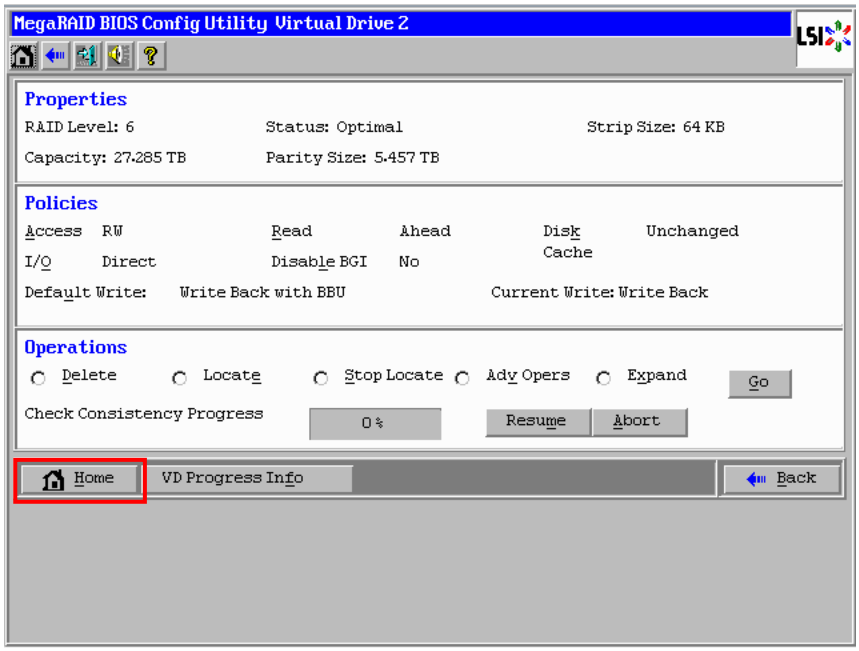

Figure B.2.8-11 Virtual Drive window (2)

(14) Click [Exit] under the menu on the left side in the main menu window.

(15) The exit confirmation window is displayed as shown in Figure B.2.8-12.
Click [Yes] button.

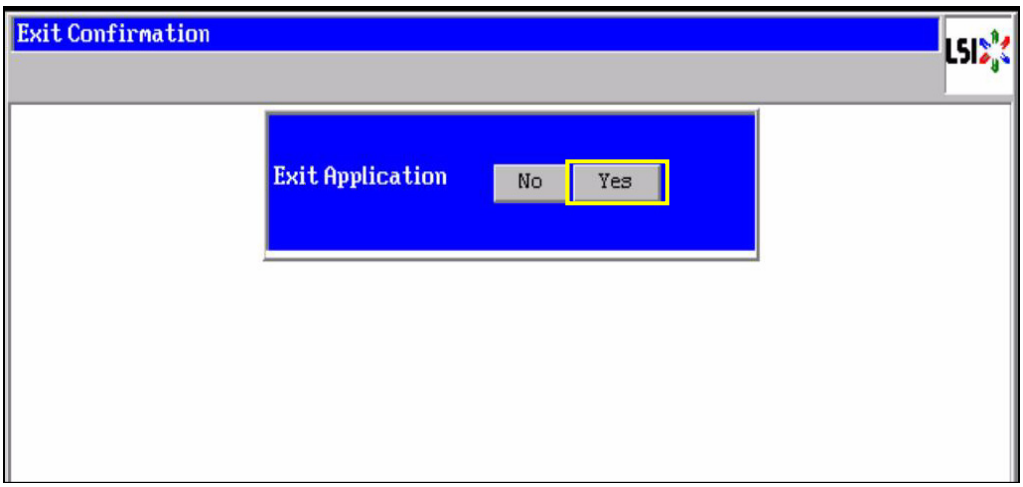

Figure B.2.8-12 Exit Confirmation window

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(16) The reset page window is displayed as shown in Figure B.2.8-13. Press the power switch to turn off the power of the node.
For the location of the power switch, refer to 'A.2.1 Front side'.

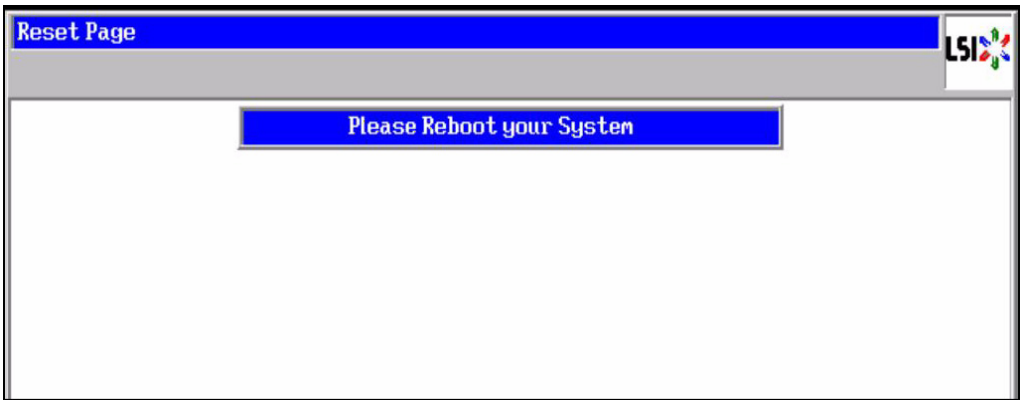

Figure B.2.8-13 Reset Page window

(17) Return to the caller and execute the rest of the procedures.

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B.2.9 Other Setting/Confirmation Items

(1) Confirmation of the setting of Hyper-threading
It is confirmed that the setting of Hyper-threading is [Disabled].

(a) Log in to the node to be maintained from the maintenance PC.
Refer to "Maintenance Tool '1.3 Procedures for Operating Commands' (MNTT 01-0200)" for Login.

(b) Execute "mpstat -P ALL". The execution example is shown in Figure B.2.9-1. Confirm that the values in the CPU row are "all" or the numbers from 0 to 5.

If there is a number greater than or equal to 6 in the CPU row, Hyper-threading must be set to Enabled. Execute 'B.2.7 Confirmation of CPU Virtualization Support Mechanism' again to set Hyper-threading to [Disabled].

```
$ mpstat -P ALL
Linux 2.6.30.1-HFSL (DXXXXXXXXXXX)      09/08/2014      _x86_64_

04:50:35 PM  CPU   %user   %nice   %sys %iowait   %irq  %soft  %steal   %idle    intr/s
04:50:35 PM  all    0.24    0.00   0.14    0.06   0.00   0.01    0.00   99.55   1042.39
04:50:35 PM    0    0.29    0.00   0.14    0.17   0.00   0.02    0.00   99.37     34.99
04:50:35 PM    1    0.23    0.00   0.14    0.04   0.00   0.00    0.00   99.59      0.00
04:50:35 PM    2    0.24    0.00   0.14    0.04   0.00   0.00    0.00   99.58      0.00
04:50:35 PM    3    0.24    0.00   0.13    0.04   0.00   0.00    0.00   99.60      0.00
04:50:35 PM    4    0.23    0.00   0.13    0.03   0.00   0.00    0.00   99.61      0.00
04:50:35 PM    5    0.22    0.00   0.14    0.04   0.00   0.00    0.00   99.60      0.00
```

Figure B.2.9-1 Execution example of the command

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B.3 Maintenance CLI

B.3.1 Displaying the Hardware Status (hwstatus)

The hwstatus command displays the hardware status of the node.

B.3.1.1 Command line

The command line of the hwstatus command can use the following options.

hwstatus [-h]

Table B.3.1.1-1 shows the description of the options.

Table B.3.1.1-1 Command Options

No.	Option	Description	Remarks
1	-h	Displays the format of the command.	—

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B.3.1.2 Output format

The output format at the time of hwstatus command execution is shown in Figure B.3.1.2-1, and the contents of the output format are shown in Table B.3.1.2-1.

```
Output format of hwstatus

Model Information                                                                   1
 HITACHI      Compute Rack 220S
SerialNumber Information                                                            2
 323GQA220VM-TNNN5N000000004
Fan Information                                                                     3
 0            ok                    -
 1            failed                -
 (Repeat for the number of cooling fan unit)
Temperature Information                                                             4
 0            ok                    reading:33_(+/-_1)_degrees_C
(Repeat for the number of temperature sensor.)
PowerSupply Information                                                             5
 0            ok                    -
 1            failed                -
Memory Information                                                                  6
 0            installed             locator: CPUX_DIMMXX,size:YYYY_MB
 1            not_installed         locator: CPUX_DIMMXX,size:-
 (Repeat for the number of DIMMs)
MemoryTotal Information                                                             7
 0            -                     size: 5.5_GB(6.0_GB)
InternalHDD Information                                                             8
 0            ok                    size:XXX.XXX_GB,raid_level:RAIDX,media_error:0,predictive_failure:0
 1            failed                size:XXX.XXX_GB,raid_level:RAIDX,media_error:0,predictive_failure:0
InternalRAIDBattery Information                                                     9
 -            -                     -
BMC Information                                                                     10
 status       ok
 connection   ok
Network Interface                                                                   11
 mng0         up                    linkspeed: XXXXBase,mediatype:Copper,Management port
 hb0          down                  linkspeed: XXXXBase,mediatype:Copper,Heartbeat port
 (Repeat for the number of port names)
FC Port Information                                                                 12
 fcXXXX up          wwpn: xxxxxxxxxxxxxxxx, linkspeed:8_Gbit
 fcXXXX up          wwpn: xxxxxxxxxxxxxxxx, linkspeed:8_Gbit
(Repeat for the number of port names)
```

Figure B.3.1.2-1 hwstatus Output Format

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Table B.3.1.2-1 Contents of Output Format (1/3)

No.	Item	Description	Remarks
1	Model Information		
	HITACHI	Displays the name of manufacturer.	HITACHI
	Compute Rack 220S	Displays the name of a product. The product name is shown after the manufacturer.	Compute Rack 220S
2	Serial Number Information		
	XXXXXXXXXX	Displays the serial number of a model.	—
3	Fan Information		
	0, 1, •••	Displays the sequential serial numbers of cooling fan unit.	0 to 11
	ok, failed	Displays the availability of failures of cooling fan unit. (*1)	ok : Normal status failed : Abnormal status Usually everything is “ok”.
	-	Displays the vendor's unique information acquired by the hardware.	Usually displays a hyphen.
4	Temperature Information		
	0, 1, •••	Displays the sequential system thermometer of serial numbers.	0 to 6
	ok, failed	Displays the status of the system temperature. (*1)	ok : Normal status failed : Abnormal status Usually everything is “ok”.
	reading: 33_(+/-_1)_degrees_C	Displays the vendor’s unique information acquired by the hardware.	The format depends on the vendor. (*2)
5	Power Supply Information		
	0, 1	Displays the sequential serial numbers of the power supply unit.	0 to 1
	ok, failed, not_installed	Displays the availability of power supply unit failures. (*1)	ok : Normal status failed : Abnormal status not_installed : Not installed
	-	Displays the vendor’s unique information acquired by the hardware.	Usually displays a hyphen.
6	Memory Information		
	0, 1, •••	Displays the sequential serial numbers of Memories.	0 to 11
	installed, not_installed	Displays the information of DIMM. (*1)	installed : Installed not_installed : Not installed
	locator: CPUX_DIMMXX, size:YYYY_MB	Displays the vendor’s unique information acquired by the hardware.	The format depends on the vendor. (*2)
7	MemoryTotal Information		
	0	Displays the total number of Memory in numerical order.	0
	size: xx_GB(yy_GB)	Displays the vendor’s unique information acquired by the hardware.	Displays the total sum of Memory in GB. By the configuration of the system, the total number of memory may display smaller than the installed memory that is displayed in the parentheses. (*2)

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Table B.3.1.2-1 Contents of Output Format (2/3)

No.	Item	Description	Remarks
8	Internal HDD Information		
	0, 1, ...	Displays the numbers of Internal HDD.	If 6 HDDs are installed in the front side of the node, number is 0 to 5, 12 and 13. If 12 HDDs are installed in the front side of the node, number is 0 to 13.
	ok, rebuild, failed, not_supported	Displays the embedded HDD status. (*1)	ok : Normal status rebuild : RAID is being rebuilt failed : A hardware failure was detected in the disk. Some disks have failures or do not exist. not_supported : information cannot be get due to no installation of MegaCLI.
	size:XXX.XXX_GB, raid_level:RAIDX, media_error:X,predictive_failure:X	Displays the vendor's unique information acquired by the hardware.	The format is vendor dependent. (*2) media_error:X is "1" in the case that the media error count has exceeded the threshold value. And X is "0" in the case that the media error count has been under the threshold value. A hyphen is displayed in case of an information acquisition failure. predictive_failure:X is "1" in the case that S.M.A.R.T. warnings has exceeded the threshold. And X is "0" in the case that S.M.A.R.T. warnings has been under the threshold. A hyphen is displayed in case of an information acquisition failure. (*8)
9	InternalRAIDBattery Information		
	0, 1,…	Displays the sequential serial number of Internal RAIDBattery.	In the either case shown below, displays "-". • Acquisition of the information has failed. • OS version is 4.1.0-10 or 4.1.1-XX. (because the RAID battery charge status is not monitored)
	ok, failed, charging, not_supported	Displays the charge status of the RAID battery.	
	state_of_charge:XX_%	Displays the vendor's unique information acquired by the hardware.	
10	BMC Information		
	status ok, status Unknown!	Displays this side node BMC status.	ok : Normal status Unknown! : Information acquisition of BMC fails
	connection ok, connection failed, connection none	Displays the other side node BMC connection status.	(*6) ok : Normal status failed : Communication with BMC of the other side node fails. none : Cluster is not built

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Table B.3.1.2-1 Contents of Output Format (3/3)

No.	Item	Description	Remarks
11	Network Interface		
	mng0, hb0, pm0, pm1, ethX, •••	Displays the port name. (*3) (*4)	mng0 : Management port hb0 : Heartbeat port (*6) pm0 : Maintenance port pm1 : Reset port ethX : Data port (1GbE) xgbeX : Data port (10GbE) * X indicates an integer more than or equal to 0. Example: eth1
	up, down	Displays the port status. (*3) (*4)	up : LinkUp down : LinkDown * The port not connecting the cable displays “down”. (*5)
	linkspeed: XXXXBase, linkspeed: Unknown!	Displays the link speed. (*4)	10Base : 10Mbps 100Base : 100Mbps 1000Base : 1Gbps 10000Base : 10Gbps Unknown! : Link speed is unknown
	mediatype:Copper	Displays the media type. (*3) (*4)	Copper : Copper wire
	Management port, Heartbeat port, Private maintenance port	Displays the use. (*4)	Management port : In case the port name is “mng0” Heartbeat port : In case the port name is “hb0” Private Maintenance port : In case the port name is “pm0, pm1” * The use is not displayed for other ports.
12	FC Port Information (*7)		
	fcXXXX, …	Displays the Fibre Channel port name in ascending order. (*1)	X represents an integer greater than or equal to 0. (Hexadecimal)
	up, down	Displays the port status. (*1)	up : LinkUp down : LinkDown
	wwpn: xxxxxxxxxxxxxxxx	Displays the host port WWN. (*1)	—
	linkspeed:8_Gbit	Displays the link speed. (*1)	1_Gbit : 1Gbps 2_Gblt : 2Gbps 4_Gbit : 4Gbps 8_Gbit : 8Gbps 10_Gbit : 10Gbps 16_Gbit : 16Gbps Unknown! : Displayed during LinkDown or for link speeds that are not supported

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*1: In case of an information acquisition failure, a hyphen is displayed. Note that, even in case of an information acquisition failure, the information already acquired is displayed.
*2: When the vendor's unique information does not exist, a hyphen is displayed.
*3: When the acquisition of the statuses of all pots failed, the Network Interface information is displayed in only one row. In this case, a hyphen is displayed for the port name, the port status, and the media type.
*4: When the acquisition of the status in units of ports fails, the information of the port which failed the acquisition is not displayed.
*5: Unused (unset) data port also displays "down". In this case, check if "(Not used)" is displayed just after the name of interface, by using iflist -v command. To execute this operation, refer to "Maintenance Tool '2.4 Displaying the Network Status (iflist)' (MNTT 02-0200)".
*6: Not displayed in the case of single node configuration.
*7: Nothing is shown on the OS version 5.1.0-XX or earlier. For checking the OS version, refer to "Maintenance Tool '2.34 Displaying the Version of the OS (versionlist)' (MNTT 02-2060)".
*8: "media_error" and "predictive_failure" is displayed on the OS version 5.2.0-XX or later. For checking the OS version, refer to "Maintenance Tool '2.34 Displaying the Version of the OS (versionlist)' (MNTT 02-2060)".

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B.3.1.3 Execution procedure

This subsection describes the procedure for executing the hwstatus command.

(1) Log in to the execution node via ssh from the maintenance PC usually. For the login method, refer to "Maintenance Tool '1.3 Procedures for Operating Commands' (MNTT 01-0200)".

(2) Execute the hwstatus command by each node. Figure B.3.1.3-1 shows display examples at the time of hwstatus execution.
If the hwstatus command terminated abnormally, the hardware status is not displayed, and the message ID is displayed. In this case, refer to 'B.3.1.4 Command termination messages and action to be taken', and take actions.

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```
sudo hwstatus
Model Information
 HITACHI      Compute Rack 220S
SerialNumber Information
 323GQA220VM-TNNN5N000000004
Fan Information
 0            ok            -
 1            ok            -
 2            ok            -
 3            ok            -
 5            ok            -
 6            ok            -
 7            ok            -
 8            ok            -
 9            ok            -
 10           ok            -
 11           ok            -
Temperature Information
 0            ok            reading:50_(+/-_0)_degrees_C
 1            ok            reading:56_(+/-_0)_degrees_C
 2            ok            reading:49_(+/-_0)_degrees_C
 3            ok            reading:47_(+/-_0)_degrees_C
 4            ok            reading:50_(+/-_0)_degrees_C
 5            ok            reading:50_(+/-_0)_degrees_C
 6            ok            reading:39_(+/-_0)_degrees_C
PowerSupply Information
 0            ok            -
 1            ok            -
Memory Information
 0            installed     locator:CPU1_DIMM1,size:4096_MB
 1            not_installed locator:CPU1_DIMM4,size:-
 2            installed     locator:CPU1_DIMM2,size:4096_MB
 3            not_installed locator:CPU1_DIMM5,size:-
 4            installed     locator:CPU1_DIMM3,size:4096_MB
 5            not_installed locator:CPU1_DIMM6,size:-
 6            not_installed locator:CPU2_DIMM1,size:-
 7            not_installed locator:CPU2_DIMM4,size:-
 8            not_installed locator:CPU2_DIMM2,size:-
 9            not_installed locator:CPU2_DIMM5,size:-
 10           not_installed locator:CPU2_DIMM3,size:-
 11           not_installed locator:CPU2_DIMM6,size:-
MemoryTotal Information
 0            size:11.5_GB(12.0_GB)
```

Figure B.3.1.3-1 Display Examples at the time of hwstatus Execution (1/2)

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```
InternalHDD Information
 0          ok          size:2.728_TB,raid_level:RAID6,media_error:0,predictive_failure:0
 1          ok          size:2.728_TB,raid_level:RAID6,media_error:0,predictive_failure:0
 2          ok          size:2.728_TB,raid_level:RAID6,media_error:0,predictive_failure:0
 3          ok          size:2.728_TB,raid_level:RAID6,media_error:0,predictive_failure:0
 4          ok          size:2.728_TB,raid_level:RAID6,media_error:0,predictive_failure:0
 5          ok          size:2.728_TB,raid_level:RAID6,media_error:0,predictive_failure:0
 6          ok          size:2.728_TB,raid_level:RAID6,media_error:0,predictive_failure:0
 7          ok          size:2.728_TB,raid_level:RAID6,media_error:0,predictive_failure:0
 8          ok          size:2.728_TB,raid_level:RAID6,media_error:0,predictive_failure:0
 9          ok          size:2.728_TB,raid_level:RAID6,media_error:0,predictive_failure:0
 10         ok          size:2.728_TB,raid_level:RAID6,media_error:0,predictive_failure:0
 11         ok          size:2.728_TB,raid_level:RAID6,media_error:0,predictive_failure:0
 12         ok          size:279.396_GB,raid_level:RAID1,media_error:0,predictive_failure:0
 13         ok          size:279.396_GB,raid_level:RAID1,media_error:0,predictive_failure:0
InternalRAIDBattery Information
 -          -           -
BMC Information
 status     ok
Network Interface
 mng0       up          linkspeed: 1000Base,mediatype:Copper,Management port
 eth0       down        linkspeed: Unknown!,mediatype:Copper
 eth1       down        linkspeed: Unknown!,mediatype:Copper
 eth18      down        linkspeed: Unknown!,mediatype:Copper
 eth19      down        linkspeed: Unknown!,mediatype:Copper
 eth20      down        linkspeed: Unknown!,mediatype:Copper
 eth21      down        linkspeed: Unknown!,mediatype:Copper
 pm0        down        linkspeed: Unknown!,mediatype:Copper,Private maintenance port
FC Port Information
 fc0002     up          wwpn: 50000870005aab2c, linkspeed:8_Gbit
 fc0003     up          wwpn: 50000870005aab2e, linkspeed:8_Gbit
service@DN000000004:~$
```

Figure B.3.1.3-1 Display Examples at the time of hwstatus Execution (2/2)

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B.3.1.4 Command termination messages and action to be taken

A message may be displayed when the hwstatus command is executed. Actions to be taken against messages are described in Table B.3.1.4-1 “Message IDs and Actions to be Taken”.

Table B.3.1.4-1 Message IDs and Actions to be Taken

No.	Message ID	Message	Description	Action
1	KAQM14131-E	A syntax error exists in the parameter (<*parameter*>).	The parameter has an error.	Specify the correct parameter, and execute it again.
2	KAQM14134-E	An error occurred in the shared processing of commands. (Error = <*error*>)	An error occurred in the common processing of the command.	Collect the OS log, and send it to the support center. To collect the OS log, refer to “Maintenance Tool ‘2.19 Collecting Logs (oslogget)’ (MNTT 02-1300)”.
3	KAQM14136-I	Usage: <*command-syntax*>	The command format is output.	Not required to be corresponding. Displayed when the –h option is specified. Also displayed continuously when KAQM14131-E is displayed.
4	KAQM14138-E	There are too many or too few parameters.	The parameter has excess or deficiency.	After confirming the format of the command, specify the correct parameter, and execute it again.
5	KAQM14150-E	An error occurred in the system.	An error occurred in the system.	Collect the OS log, and send it to the support center. To collect the OS log, refer to “Maintenance Tool ‘2.19 Collecting Logs (oslogget)’ (MNTT 02-1300)”.
6	KAQM14167-W	MegaCLI, which is required to acquire internal hard disk and battery information, is not installed.	Necessary commands to get the information of the built-in disks and batteries are not installed.	Execute again, by installing necessary commands to get the information of the built-in disks and batteries.

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CONTENTS

B.4 Setting Value when the OS is Installed

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B.4 Setting Value when the OS is Installed

The following shows the setting value that is required when installing OS.
After confirming the following table, return to the status before coming to this operation.
Note that CR220SM does not support the cluster configuration.

Table B.4-1 Setting Value when the OS is Installed

Item	Setting value
Configuration	Single node configuration.
User data location	[1.Internal disk]
Select whether to divide RAID groups for the system LU and for the user LU	Enter “y” (divide.)
RAID rebuilding necessity	Follow the instruction in the manual because whether RAID rebuilding is necessary or not depends on the recovery procedure.

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CONTENTS

B.5 Disk Setting

B.5.1 Acquiring WWNs of Nodes

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B.5 Disk Setting

B.5.1 Acquiring WWNs of Nodes

Acquire WWN of the node set in the HBA BIOS from the liquid crystal display or the remote console.

For connecting the liquid crystal display, refer to "Set Up '1.2 Confirmation of KVM Connection' (SETUP 01-0010,)".and for connecting the remote console, refer to "Set Up '1.4 Connection Confirmation of the Remote Console' (SETUP 01-0010.)"

(1) Perform item (a) when the OS is terminated or perform (b) when the OS is started.

(a) Start the OS by referring to "Installation '2.1.1 Procedure for turning on the power' (INST 02-0000.)"

(b) Restart the OS by referring to "Installation '2.1.3 Procedure for rebooting the OS' (INST 02-0100.)"

(2) If the following message is displayed while the OS is in operation, press [Ctrl] key while holding down the [R] key to display the Hitachi Fibre Channel Adapter ROM BIOS window.

```
<Message>
 Hitachi Fibre Channel Adapter ROM BIOS Version XX.XX.XX.XX
 Copyright (C)HITACHI,Ltd 20XX,20XX. All rights reserved.

 Press <Ctrl-R> to Enter BIOS
```

(3) Select "SELECT HBA" as shown in Figure B.5.1-1, and then press [Enter] key.

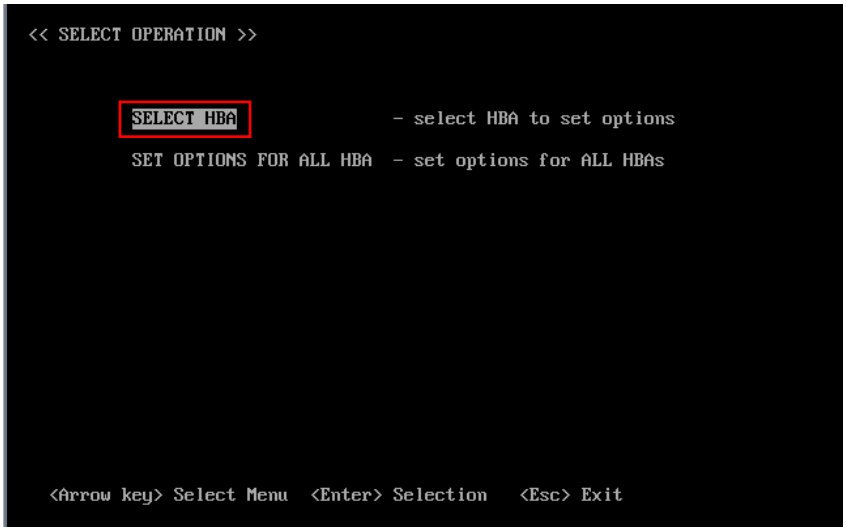

Figure B.5.1-1 SELECT OPERATION window

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(4) Take a note of WWN (16-digit alphanumeric characters) displayed at “FC WORLD WIDE NAME” as shown in Figure B.5.1-2 in the worksheet for a memo of WWN as shown in Table B.5.1-1, and then press [Esc] key to return to the previous window.

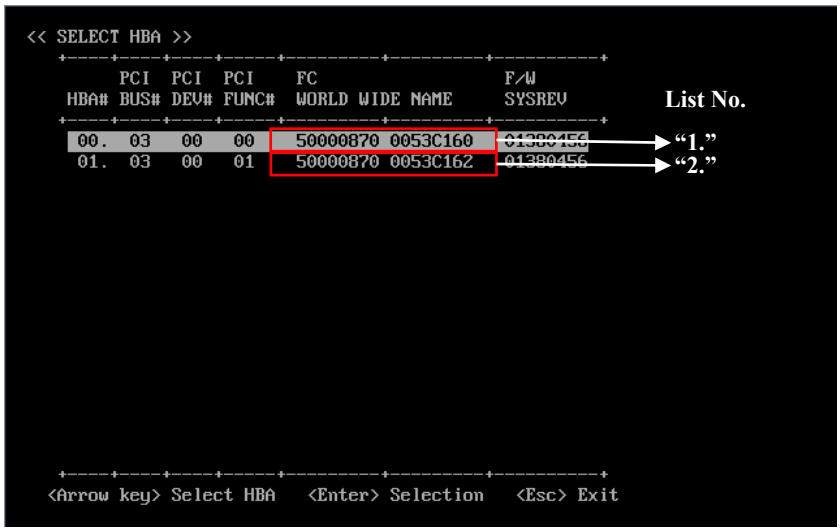

Figure B.5.1-2 SELECT HBA window (Example)

NOTE: Columns “List No.1” and “List No.2” in Table B.5.1-1 correspond to the list numbers “1” and “2” in Figure B.5.1-2.

Table B.5.1-1 Example of Writing Worksheet for Memo of WWN when the port number of Node0 is “1”

	List No.1 (*1)	List No.2 (*2)
node	50000870 0053C160	

*1: This corresponds to the port “fc0004” in ‘Table A.2.2.2-1 Rear View of the Node (Example.)’
*2: This corresponds to the port “fc0005” in ‘Table A.2.2.2-1 Rear View of the Node (Example.)’

(5) The window as shown in Figure B.5.1-1 is displayed. Press [Esc] key to display the EXIT SETUP window as shown in Figure B.5.1-3. Select “EXIT SETUP” and press [Enter] key. The node will be rebooted.

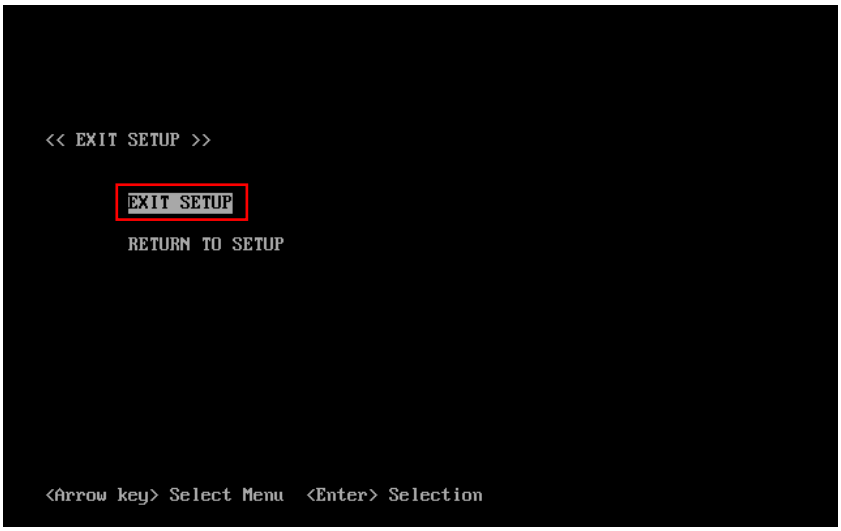

Figure B.5.1-3 EXIT SETUP window

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CONTENTS

C.1 Local Initial Operations According to Maintenance Request

C.1.1 When Detected by HiTrack

C.1.2 When Detected by SNMP Trap

C.1.3 When the System Administrator Noticed a Failure

C.1.3.1 Action to be taken in the cluster configuration

C.1.3.2 Action to be taken it the single node configuration

C.1.4 When the Maintenance Personnel Noticed the Failure at the Time of Initial Installation in the Local Site

C.1.5 Determination Procedure for the Possible Failure Part when a PCI Error Occurred

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C.1 Local Initial Operations According to Maintenance Request

Before troubleshooting, this chapter describes precautions for maintenance personnel to refer to maintenance procedures in HA8000 maintenance manual partly.

Determination of a failure and parts replacement of Hitachi Data Ingestor (HDI) hardware are performed with reference to both the HDI maintenance manual and the HA8000 maintenance manual for which maintenance personnel need to do a certain amount of work in the HA8000 maintenance manual first and return to the work in the HDI maintenance manual.

Figure C.1-1 shows general flow for the maintenance personnel to refer to the proper procedures described in the two maintenance manuals while performing troubleshooting or parts replacement of HDI hardware.

The maintenance personnel must refer to and understand the flow in Figure C.1-1 before performing troubleshooting or parts replacement.

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Troubleshooting or parts replacement policy using two manuals (*)

- ✓ Start a failure determination with HDI maintenance manual.
- ✓ Determine a failure by HATP if node is down; determine a failure by SIM of the OS if node is running.
- ✓ Do not refer to the parts replacement procedure of HA8000 maintenance manual from the result of the failure determination of HA8000 maintenance manual; return to the caller of HDI maintenance manual and follow the instruction.
- ✓ If the node did not recover from the failure after part replacement, determine the failure again.

*: "Two manuals" indicates HDI maintenance manual and HA8000 maintenance manual.

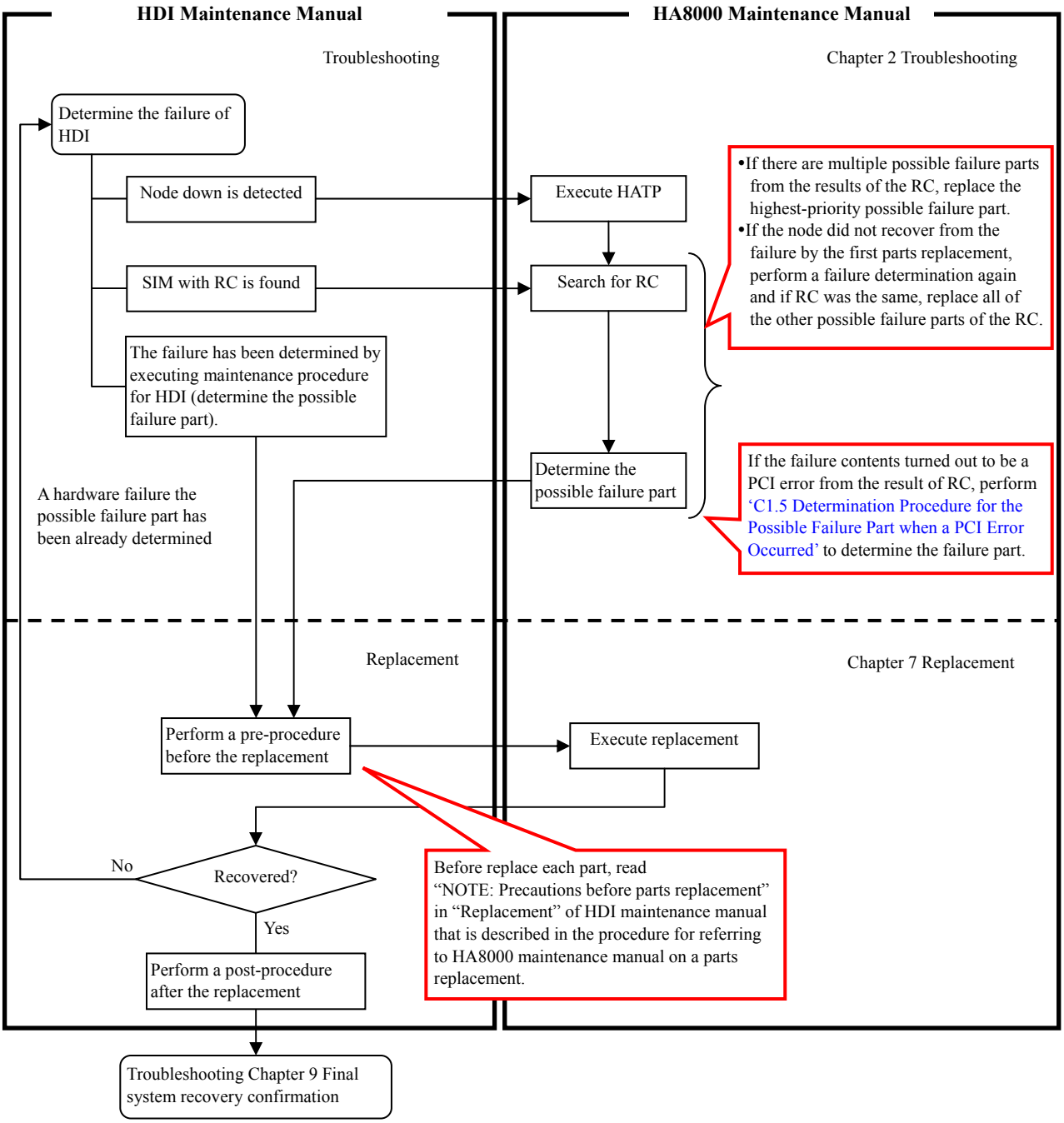

Figure C.1.1 General Flow for Referring to Procedures in Two Manuals

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C.1.1 When Detected by HiTrack

A failure detected by HiTrack is reported to the Maintenance Center of (HDS) by HiTrack. The maintenance personnel should perform the failure analysis according to the following.

(1) Receive the failure information acquired by HiTrack from the Maintenance Center of (HDS) via FTP or e-mail.

(2) Acquire TagID and SIM from the received failure information.
The acquired TagID is used in the failure analysis to specify the failure occurrence node and to replace the parts. The acquired SIM is used in the failure analysis to analyze the failure of Hitachi Data Ingestor.

NOTE: The acquired SIM is the one when the failure occurred or when the communication with the node was disrupted.
Maintenance personnel need to confirm the SIM by connecting the maintenance PC even at the local site.

(3) Based on the acquired TagID and SIM, perform the failure analysis and failure determination operation.
For the details of the failure analysis and the failure determination operation, refer to 'C.2.2 Determination Procedure when a Failure Occurred'.

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C.1.2 When Detected by SNMP Trap

When monitoring by SNMP, a failure detected by HDI is stored in the SNMP Trap server as a failure information equivalent to SIM and reported to the SNMP manager. After that, it is reported to the Maintenance Center of (HDS) by the system administrator. The maintenance personnel should perform the local initial measurement and failure analysis according to the following.

(1) By requesting the system administrator, receive all the SNMP Trap. Maintenance personnel should check the Trap IDs and Trap messages in the received SNMP Trap, and check whether there is a Trap where the SIM of HDI is stored or not. For the details of SNMP Trap where the SIM of HDI is stored, refer to "Troubleshooting '7.2 Messages of Trap that the Maintenance Personnel should Obtain Table 7.2-1 SNMP Trap to be sent by HDI' (TRBL 07-0010).

(2) Based on the management IP address (IP address of the port used in the operation in the single node configuration) of the received failure information, confirm the position of the node where a failure occurred with the system administrator. The confirmed position of the node where a failure occurred is used in the failure analysis for specifying the failure occurrence location and for replacing.

(3) Based on the collected failure information, perform the failure analysis and failure determination operation. For the details of the failure analysis and failure determination operation, refer to 'C.2.2 Determination Procedure when a Failure Occurred'.

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C.1.3 When the System Administrator Noticed a Failure

When the system administrator detected a failure, it is reported to the Maintenance Center of (HDS) by the system administrator. The maintenance personnel should perform the local initial measurement and failure analysis according to the following.
In the single node configuration, the system administrator should determine a failure in advance to make shorten of downtime.
Refer to C.1.3.1 Action to be taken in the cluster configuration for the cluster configuration and 'C.1.3.2 Action to be taken it the single node configuration' for the single node configuration.

C.1.3.1 Action to be taken in the cluster configuration

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C.1.3.2 Action to be taken it the single node configuration

(1) In the single node configuration, maintenance personnel get the result of failure determination operation from the system administrator, and execute the action to be taken according to the result. Figure C.1.3.2-1 shows the overview of the determination flow to be executed by the system administrator.

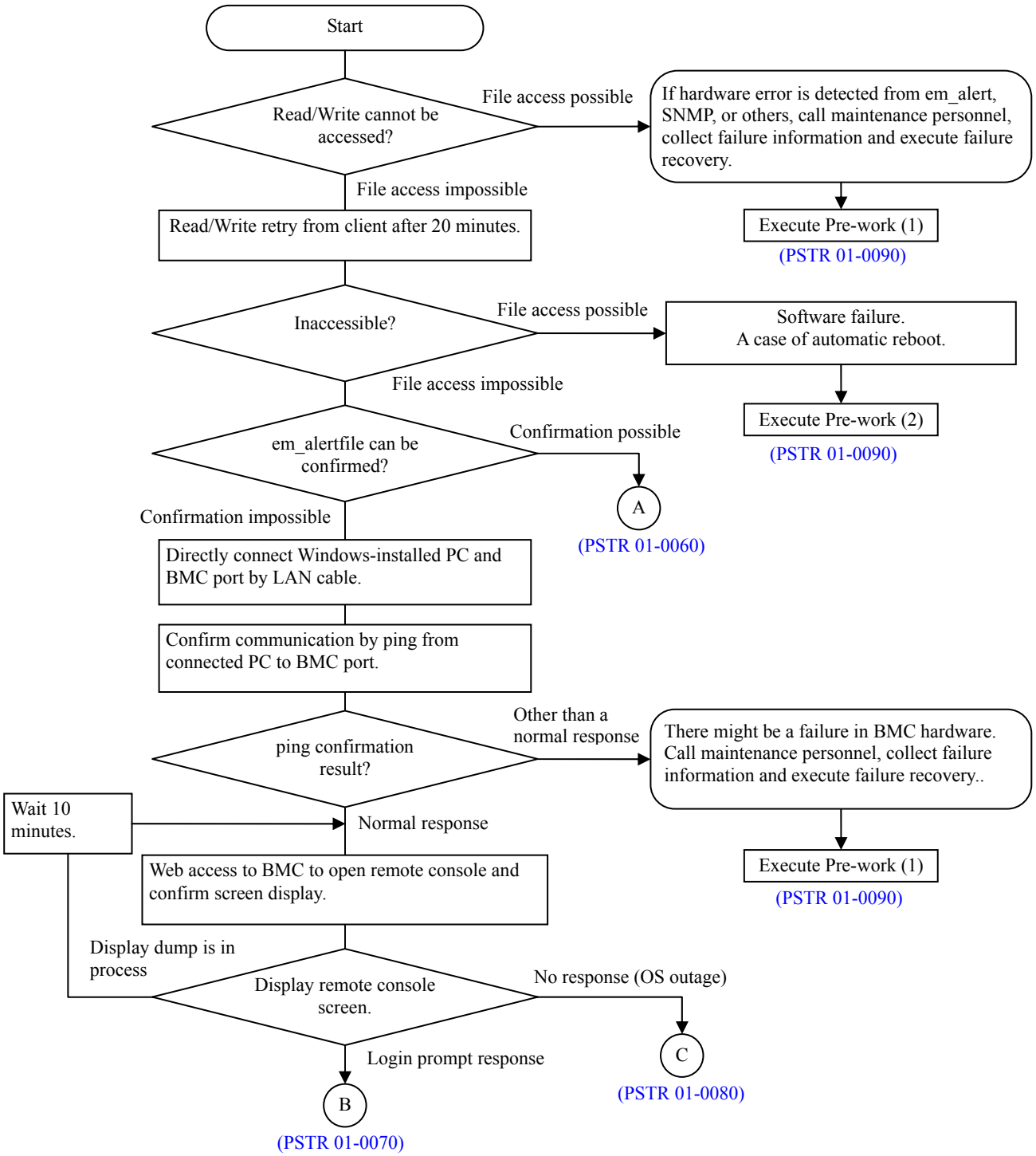

Figure C.1.3.2-1 Overview of Determination Flow by System Administrator (1/4)

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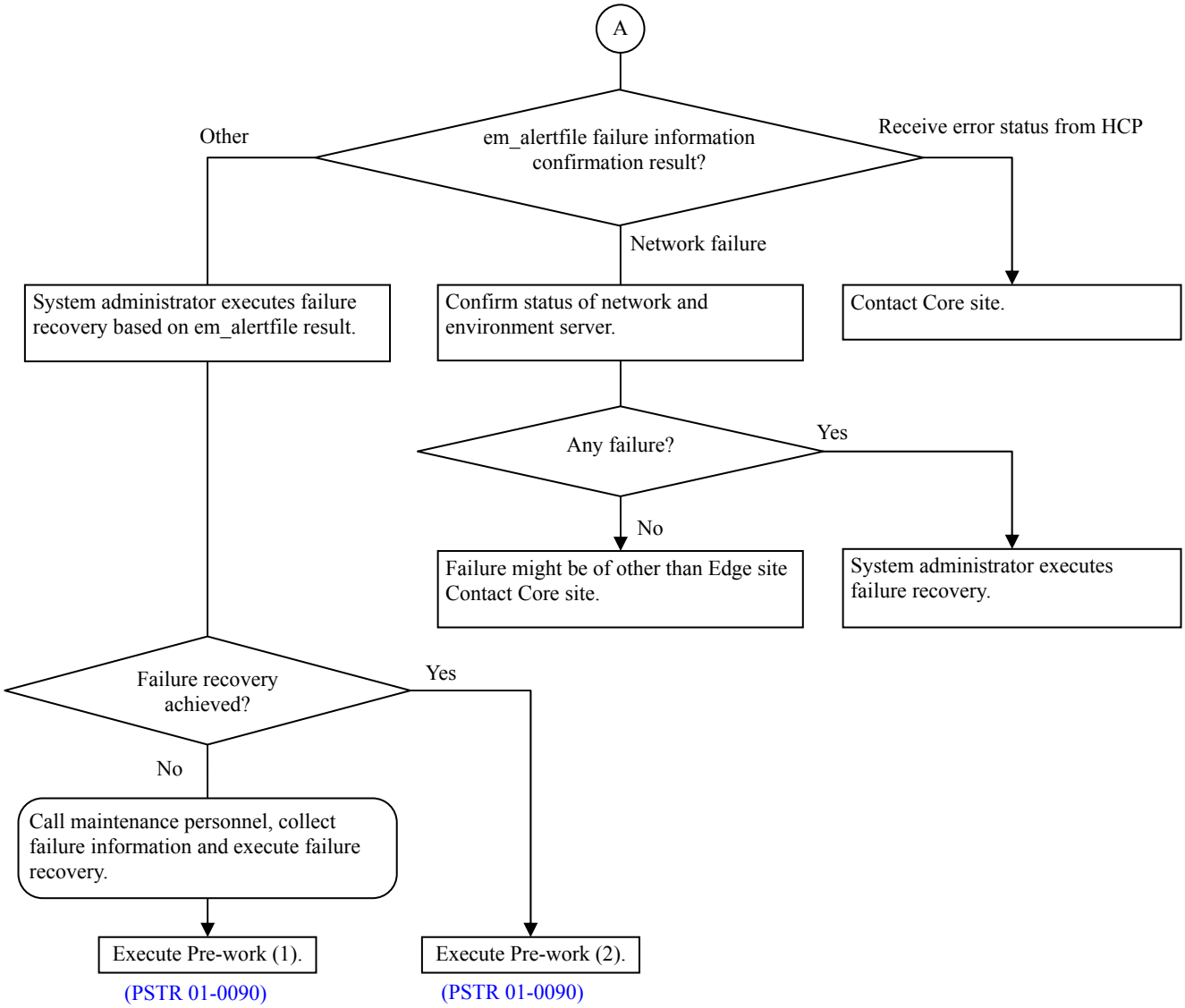

Figure C.1.3.2-1 Overview of Determination Flow by System Administrator (2/4)

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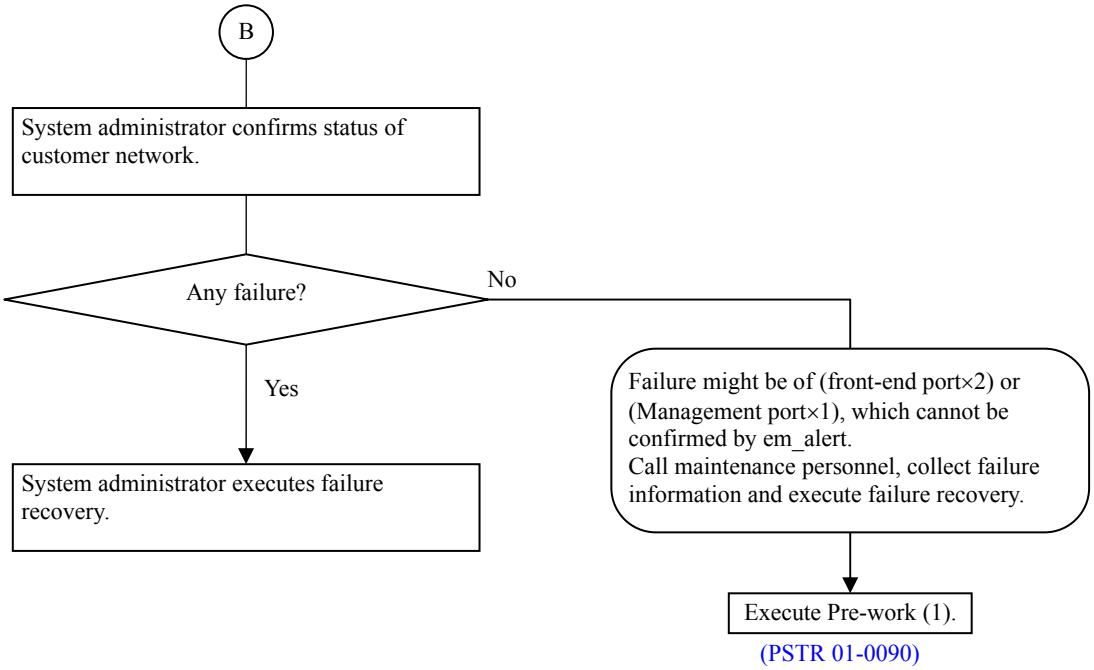

Figure C.1.3.2-1 Overview of Determination Flow by System Administrator (3/4)

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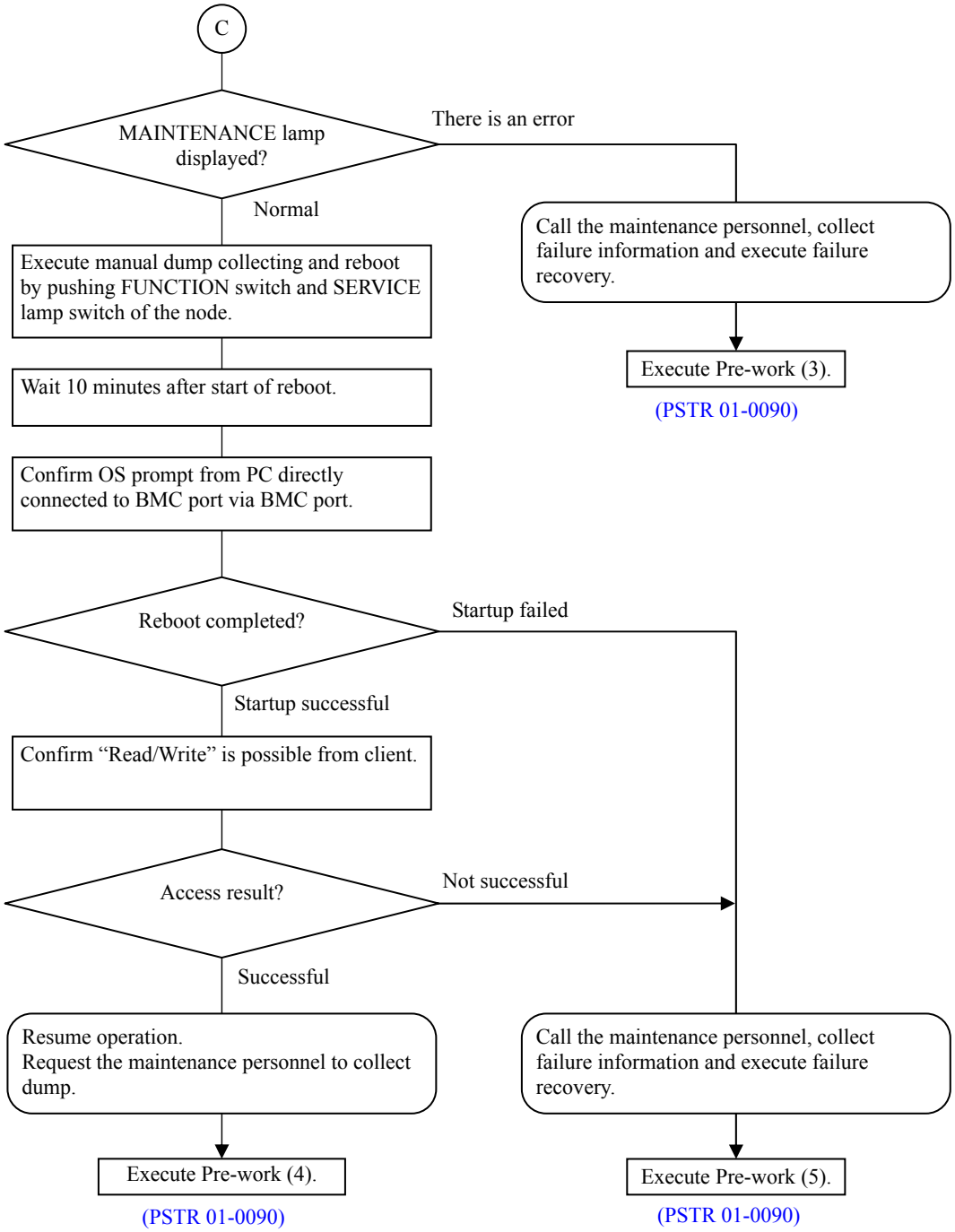

Figure C.1.3.2-1 Overview of Determination Flow by System Administrator (4/4)

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<Pre-works in the single node configuration>

Pre-work (1) OS is running, and when the system administrator cannot restore from the failure information (such as em_alert/SNMP Trap).
Execute failure analysis and the failure determination based on the collected failure information.
Refer to 'C.2.2 Determination Procedure when a Failure Occurred' for the details of failure analysis and determination process of a failure.

Pre-work (2) OS is running, and when the system administrator can be restored from the failure information (such as em_alert/SNMP Trap).
Because the restarting operation is available, collect the failure information from the system administrator.

Pre-work (3) It cannot confirm that the OS is running or not, and the MAINTENANCE lamp display of a node shows an error.
Execute failure analysis and the failure determination based on the collected failure information.
Refer to 'C.2.2 Determination Procedure when a Failure Occurred' for the details of failure analysis and determination process of a failure.

Pre-work (4) When the system administrator executes the dump manually and then after collecting the dump manually, the system starts automatically and confirmed that the I/O operation is available (This is executed when it is unknown if the OS is running and the MAINTENANCE lamp display shows normal.)
Because the restarting operation is available, collect the failure information from the system administrator.

Pre-work (5) After collecting the dump manually by the system administrator, the system does not start automatically or the I/O operation cannot be done after restarting. (This is executed when it is unknown if the OS is running and the MAINTENANCE lamp display shows normal.)
Execute failure determination operation.
Refer to 'C.2.2 Determination Procedure when a Failure Occurred' for the details of failure analysis and determination process of a failure.

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C.1.4 When the Maintenance Personnel Noticed the Failure at the Time of Initial Installation in the Local Site

When the maintenance personnel noticed the ERROR lamp lighting and the LED lighting of the parts of the node in which the failure occurred, perform the local initial measurement and failure analysis according to the following.

(1) Check the alarm lighting of the installed parts and others of the node in which the failure occurred.

(2) Perform “hwstatus” for the node in which the failure occurred.
For the details of “hwstatus”, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus)’.

(3) Acquire the result of “hwstatus”.

(4) Based on the result of “hwstatus”, replace the failure occurrence parts of the failure occurrence node.
For the details of the part replacement, refer to “Replacement ‘Chapter 1 Replacing the Components of Hitachi Data Ingestor’ (REP 01-0000)”.

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C.1.5 Determination Procedure for the Possible Failure Part when a PCI Error Occurred

If SIM message in a failure notice is “KAQK30801-E”, the failure content can be determined by RC information which is included in the SIM message.

Although, in the case the failure content of RC turns out to be a PCI error (PCI PERR, PCI SERR), RC information alone is not enough to determine the possible failure part; you need to refer to another table as described below in that case.

The following is a sample of the RC information in the case of a PCI error (PCI PERR, PCI SERR.)

10 2000 08 07406FF0 XXXXXXXX	<Event description> CPU1 detected IERR. <Cause> BMC detected occurrence of CPU IERR (Internal Error) by monitoring CATERR# signals and MCERR#. <Action> [CHK] # If a PCI PERR/SERR, correctable memory error, or an uncorrectable memory error, or a BIOS-detected uncorrectable bus error occur simultaneously, troubleshoot these errors first. [RPL] 1. Check PCI cards and selectively replace memory attached to CPU1. 2. Try replacing CPU1 and mother board in succession. 3. Check for OS-related problems.

Figure C.1.5-1 RC Information and the Details in the Case of PCI Error (PCI PERR, PCI SERR)

Execute the following procedure when a PCI error (PCI PERR, PCI SERR) described above occurred.

(1) Refer to “Last 4 bytes of RC” column of Table “3. CR220SM (SandyBridge-EN) model” in “Maintenance Manual Hitachi Compute Rack 220SM [System Unit]” which is in the reference page described below and find the appropriate row.
<Reference page>
The reference page (“SELs of PCI PERR and PCI SERR”) is in the file which opens on clicking “Maintenance Manual Hitachi Compute Rack 220SM [System Unit] Appendix b. If the SEL/RC corrective action includes descriptions of any of the items below, see the information here.”

(2) Replace the first part described in the column “Slot/Device” of the row you found as the first possible failure part (the first replacement part.) For the replacement procedure, refer to “Maintenance Manual Hitachi Compute Rack 220SM [System Unit] 7 Part Replacement.”
If the node did not recover from a failure even after the replacement of the first possible failure part (the first replacement part), replace all the rest of the parts described in the column “Slot/Device” of the row you found, and perform the procedure 1 to 3 of “If the above is not successful in isolation.”

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C.2 Failure Determination Procedure

C.2.1 Procedures of Troubleshooting at the Time of Setup

(1) Figure C.2.1-1 shows the flowchart when message IDs described in Table C.2.1-1 are output due to the failure of new installation or the failure of update installation.

Table C.2.1-1 List of Message IDs (1)

Message ID	KAQG61007-E KAQG61008-E KAQG61010-E KAQG61025-E KAQG61027-E

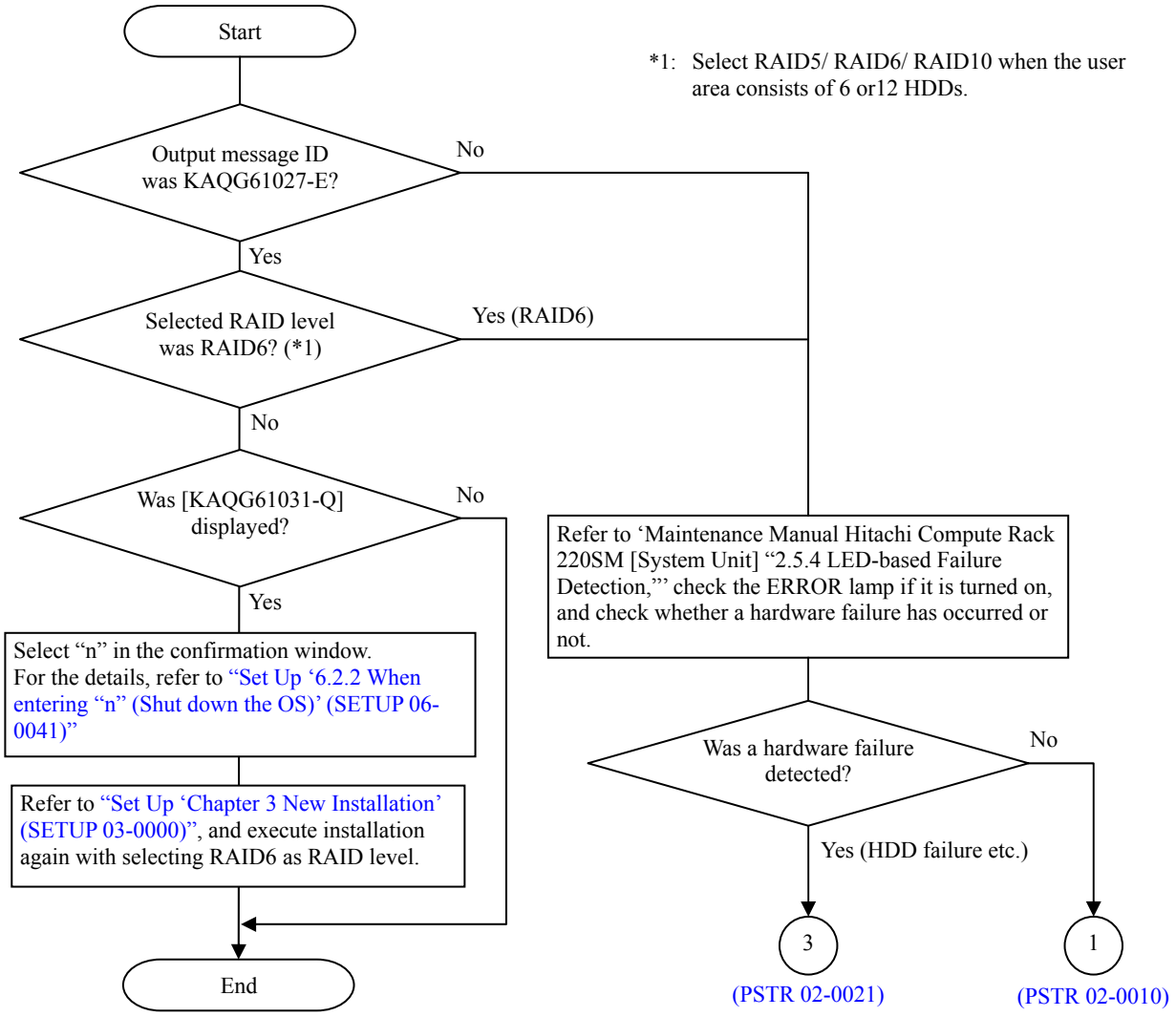

Figure C.2.1-1 Flow of Diagnosis for the Media Failure (1/4)

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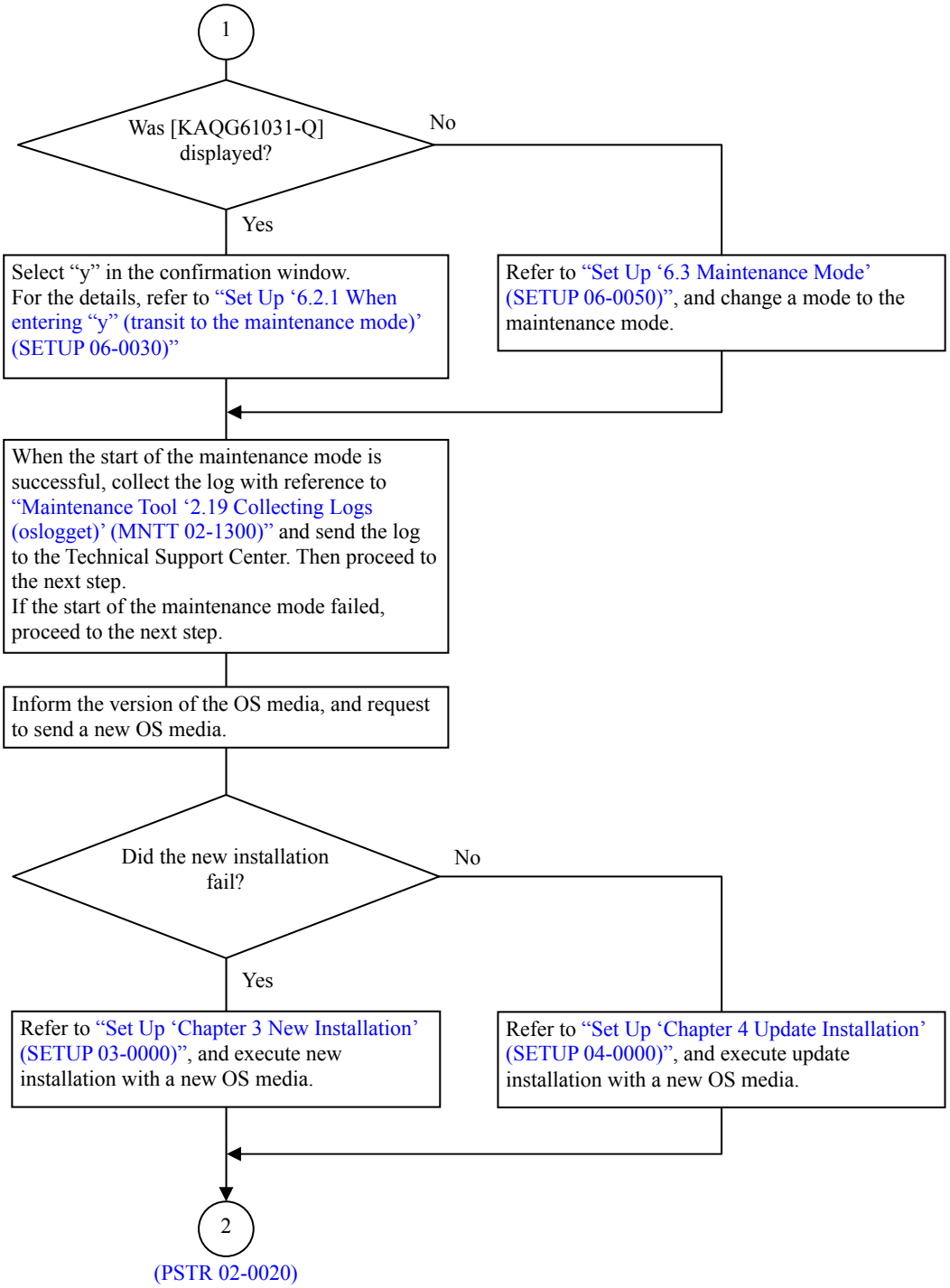

Figure C.2.1-1 Flow of Diagnosis for Media Failure (2/4)

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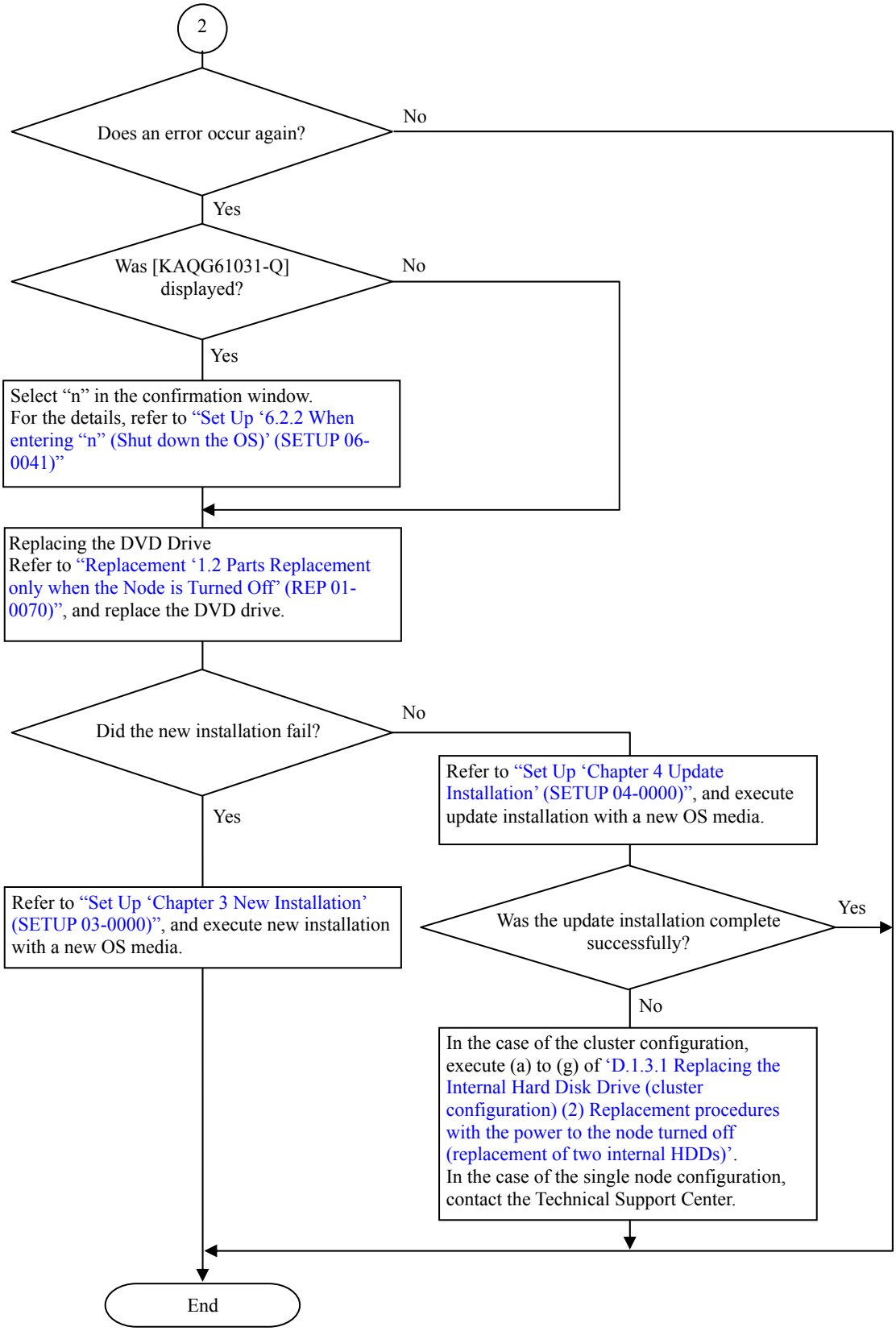

Figure C.2.1-1 Flow of Diagnosis for Media Failure (3/4)

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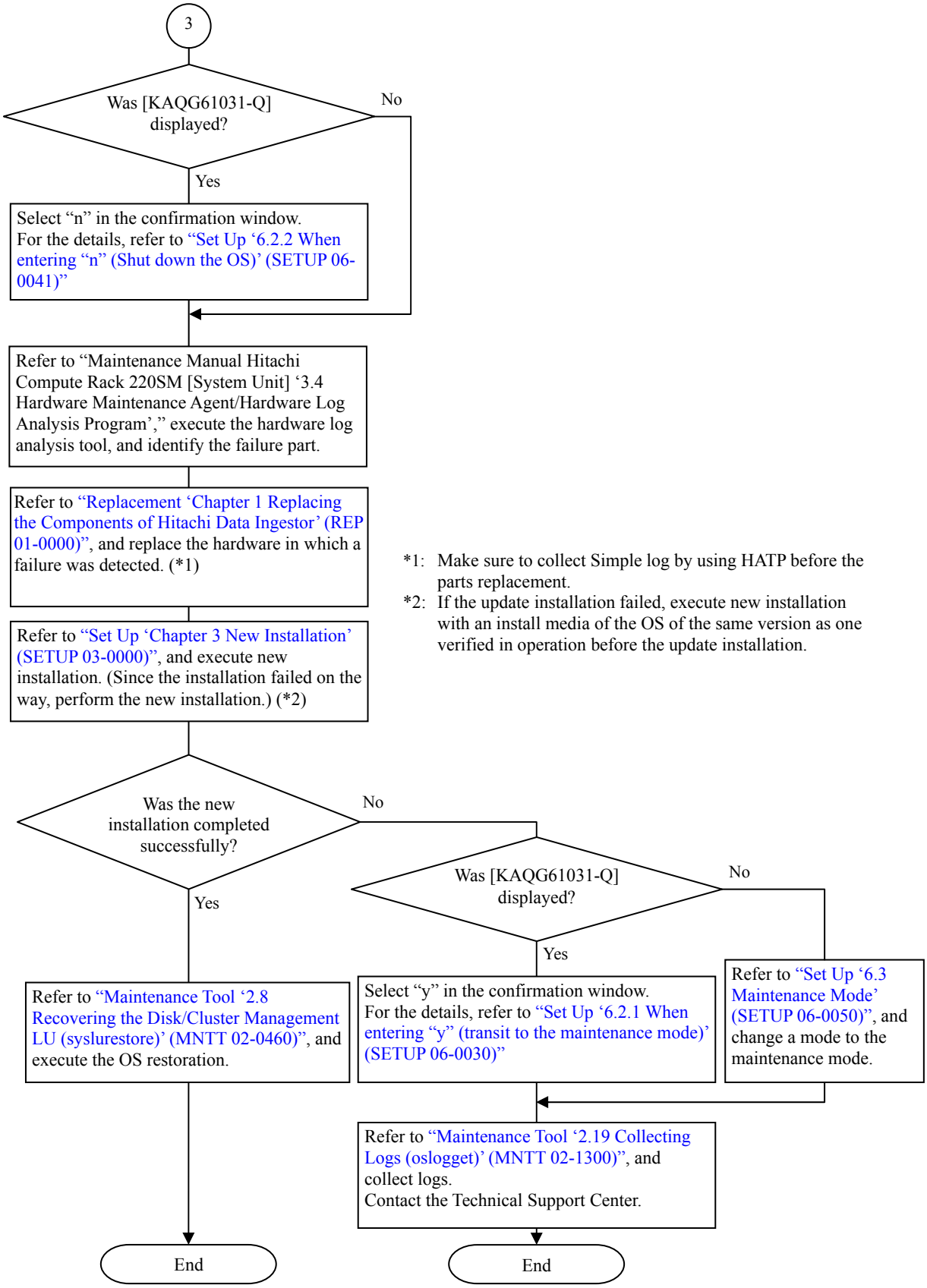

*1: Make sure to collect Simple log by using HATP before the parts replacement.
*2: If the update installation failed, execute new installation with an install media of the OS of the same version as one verified in operation before the update installation.

Figure C.2.1-1 Flow of Diagnosis for Media Failure (4/4)

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(2) Figure C.2.1-2 shows the flowchart when message IDs described in Table C.2.1-2 are output due to the failure of new installation.

Table C.2.1-2 Message IDs List (2)

Message ID	KAQG61020-E KAQG61021-E KAQG61022-E KAQG61009-E KAQG61011-E KAQG61012-E KAQG61013-E KAQG61014-E KAQG61015-E KAQM01024-E KAQM01025-E KAQM01026-E KAQM01028-E KAQM01097-E KAQM14105-E KAQM14134-E KAQM14150-E KAQM14152-E

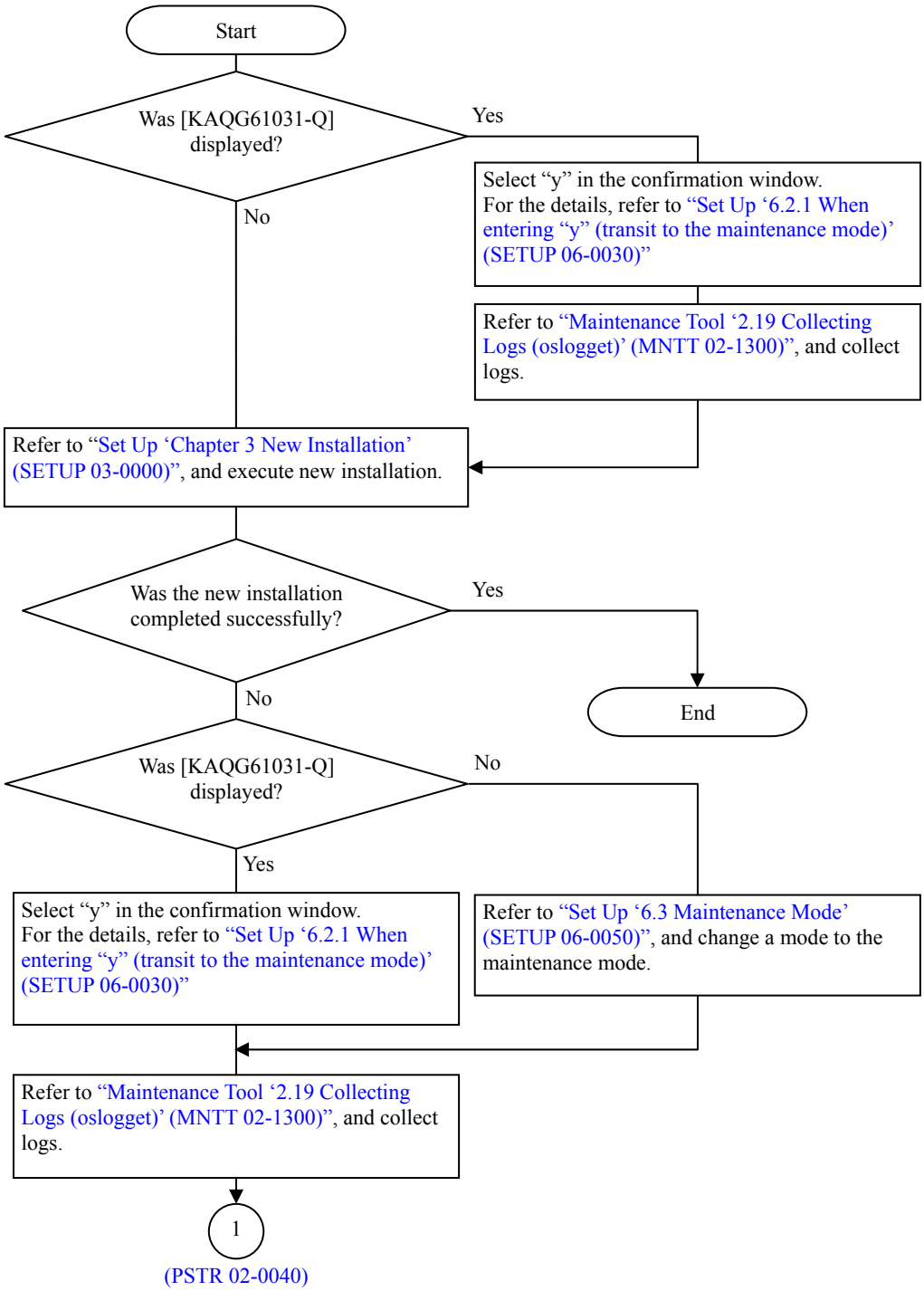

Figure C.2.1-2 Flow of Diagnosis for New Installation Failures (1/2)

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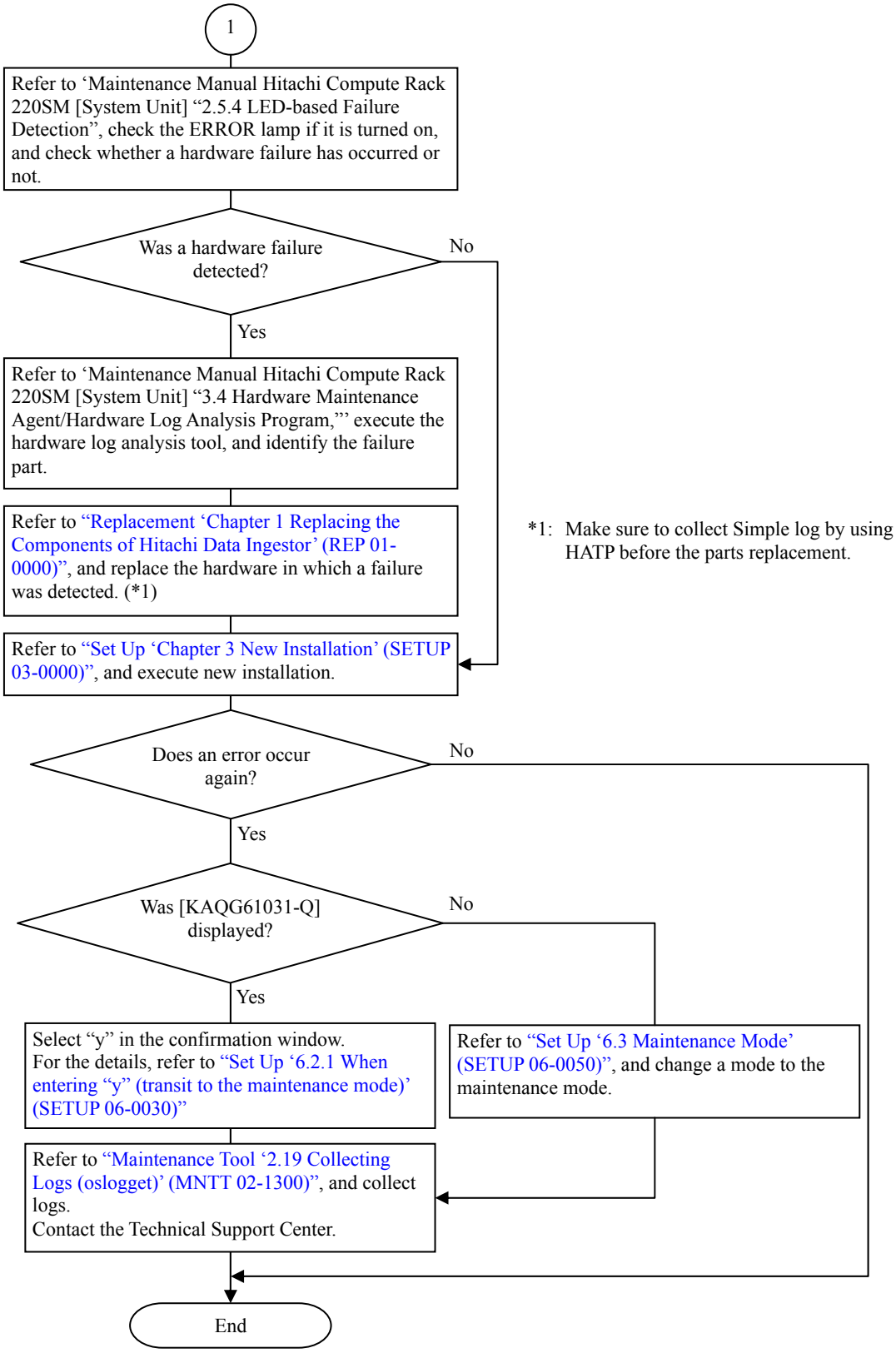

Figure C.2.1-2 Flow of Diagnosis for New Installation Failures (2/2)

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(3) Figure C.2.1-3 shows the flowchart when message IDs described in Table C.2.1-3 are output due to the failure of update installation.

Table C.2.1-3 Message IDs List (3)

Message ID	KAQG61009-E KAQG61020-E KAQG61021-E KAQG61022-E KAQG61011-E KAQG61012-E KAQG61013-E KAQG61014-E KAQG61015-E KAQG61016-E KAQM01024-E KAQM01025-E KAQM01026-E KAQM01028-E KAQM01097-E KAQM14105-E KAQM14134-E KAQM14150-E KAQM14152-E

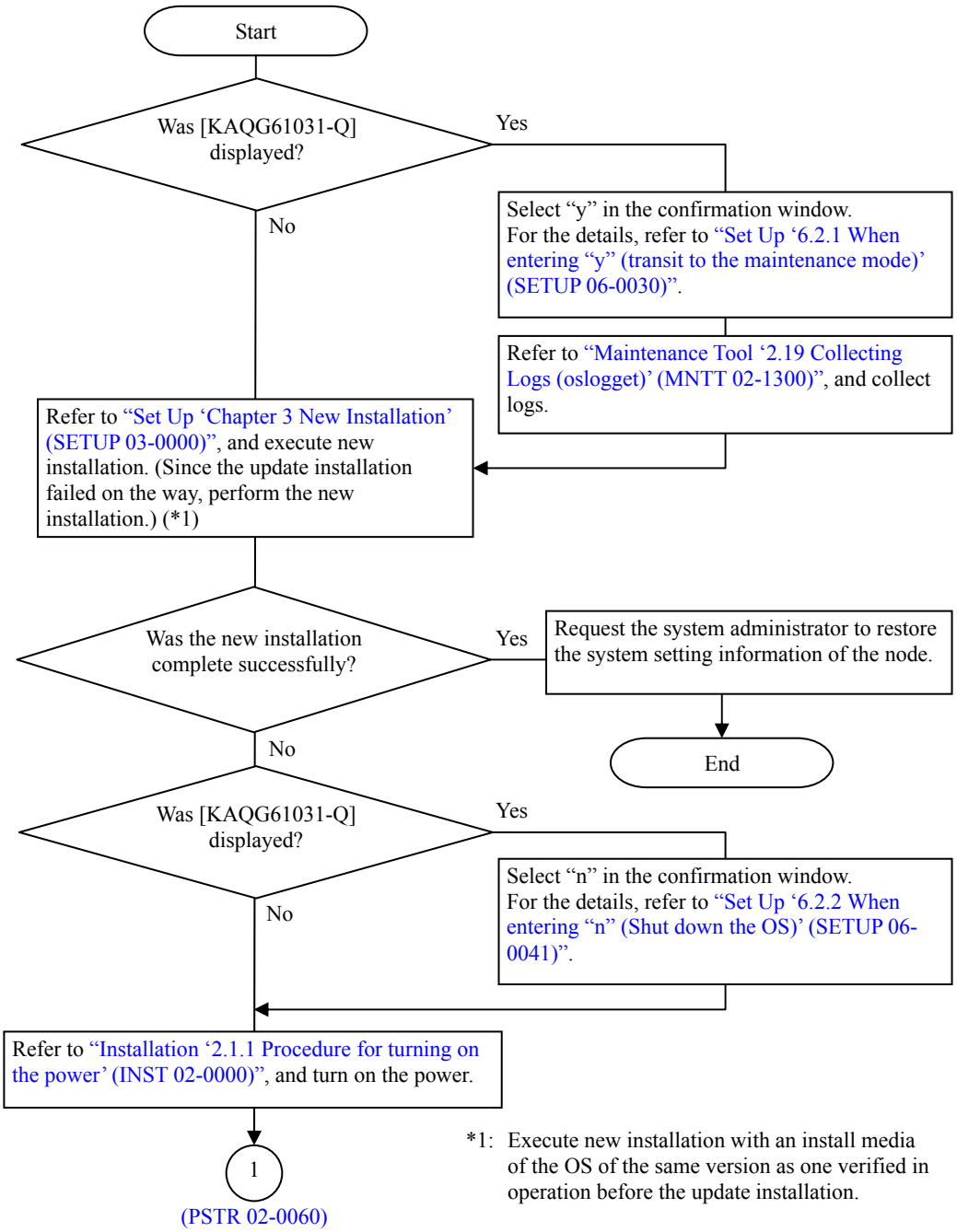

Figure C.2.1-3 Flow of Diagnosis for Update Installation Failures (1/4)

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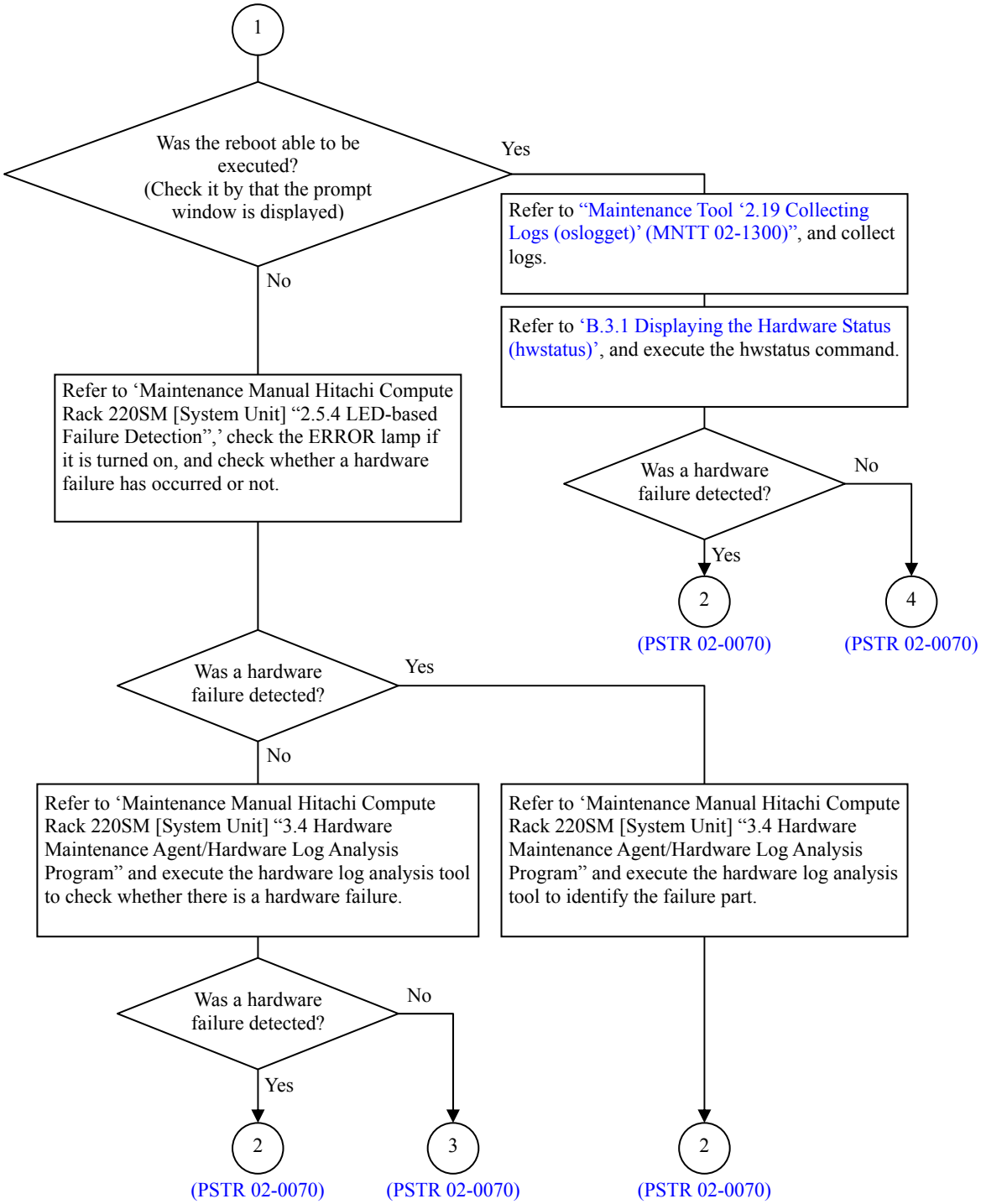

Figure C.2.1-3 Flow of Diagnosis for Update Installation Failures (2/4)

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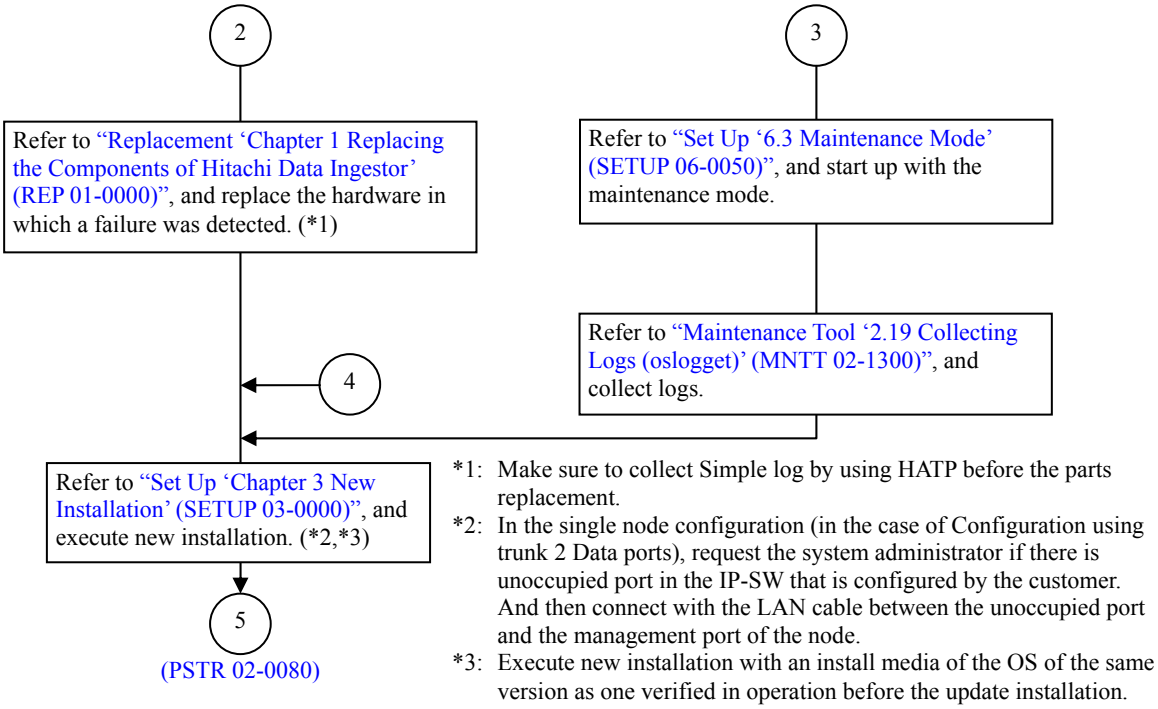

Figure C.2.1-3 Flow of Diagnosis for Update Installation Failures (3/4)

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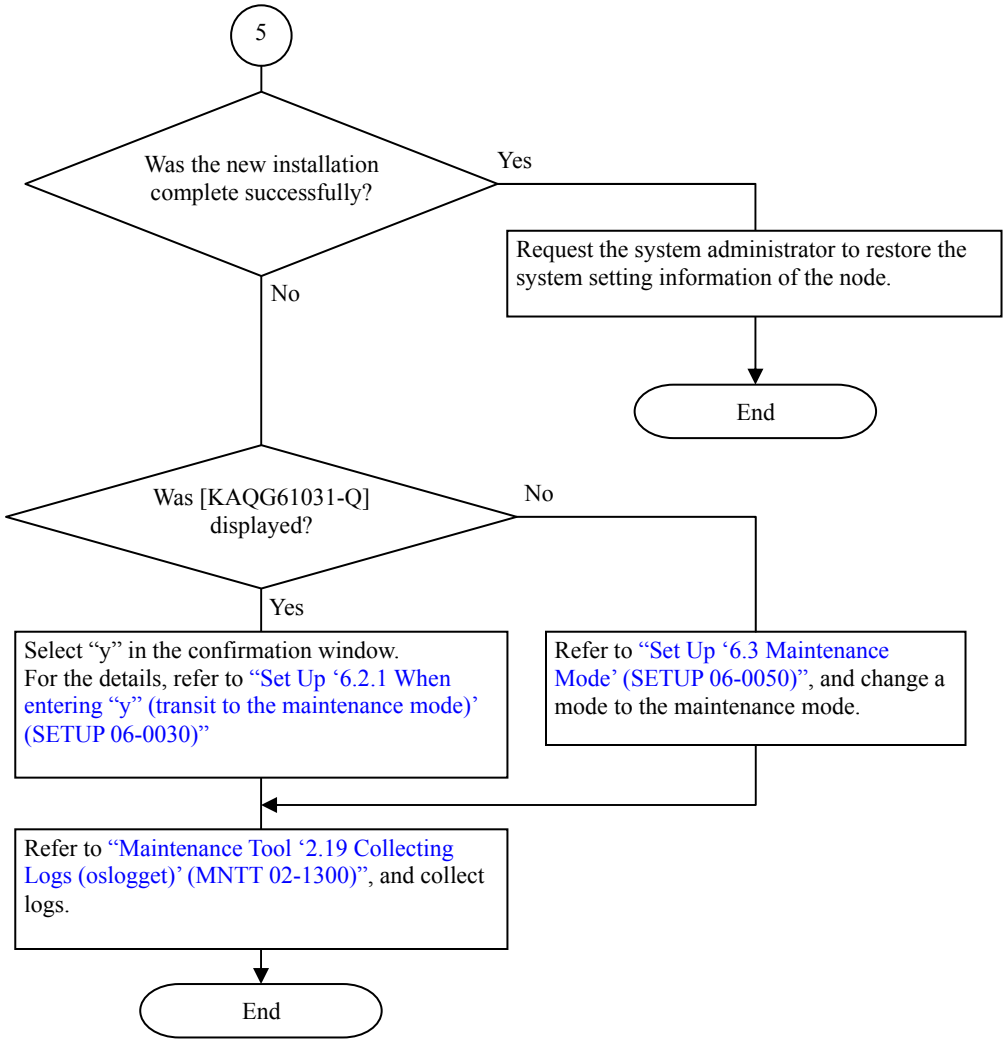

Figure C.2.1-3 Flow of Diagnosis for Update Installation Failures (4/4)

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(4) Figure C.2.1-4 shows the flowchart when message IDs described in Table C.2.1-4 are output due to the failure of update installation.

Table C.2.1-4 Message ID List (4)

Message ID	KAQG61018-W

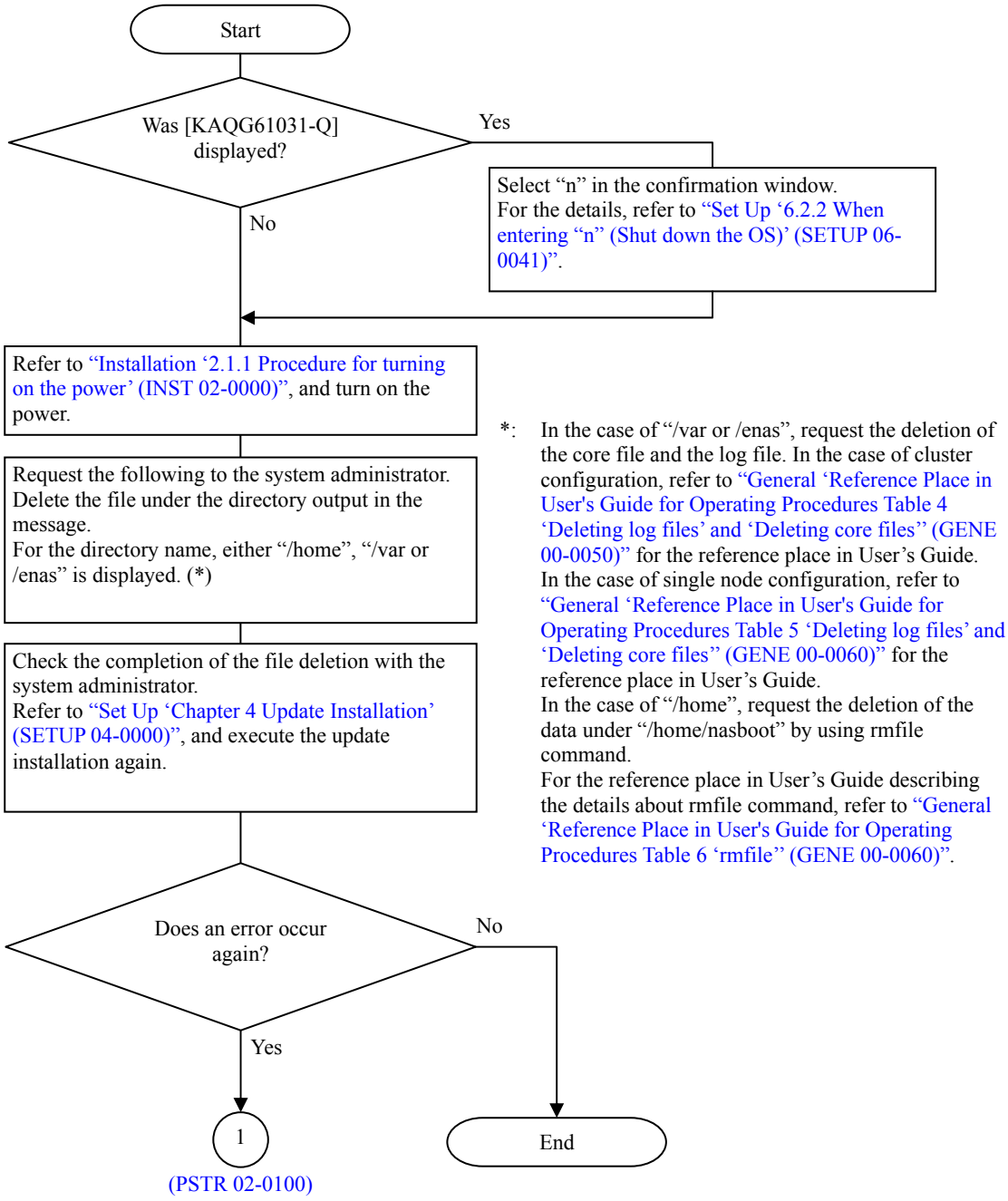

Figure C.2.1-4 Flow of Diagnosis for Lack of Free Space (1/2)

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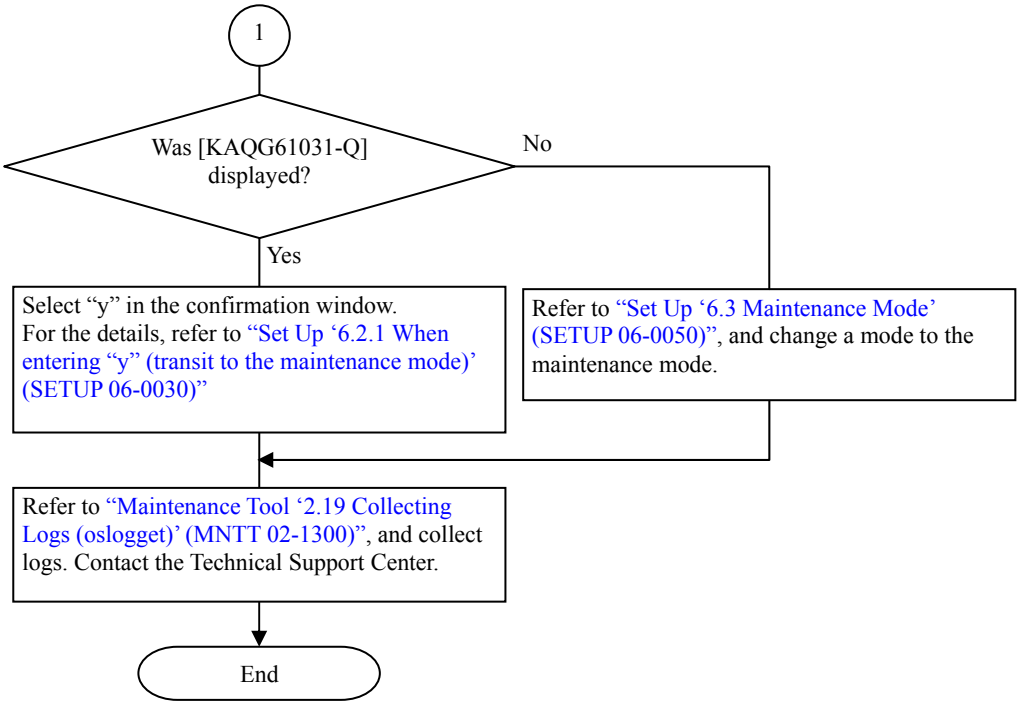

Figure C.2.1-4 Flow of Diagnosis for Lack of Free Space (2/2)

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(5) Figure C.2.1-5 shows the flowchart when message IDs described in Table C.2.1-5 are output by the version check during update installation.

Table C.2.1-5 Message ID List (5)

Message ID	KAQG61024-E

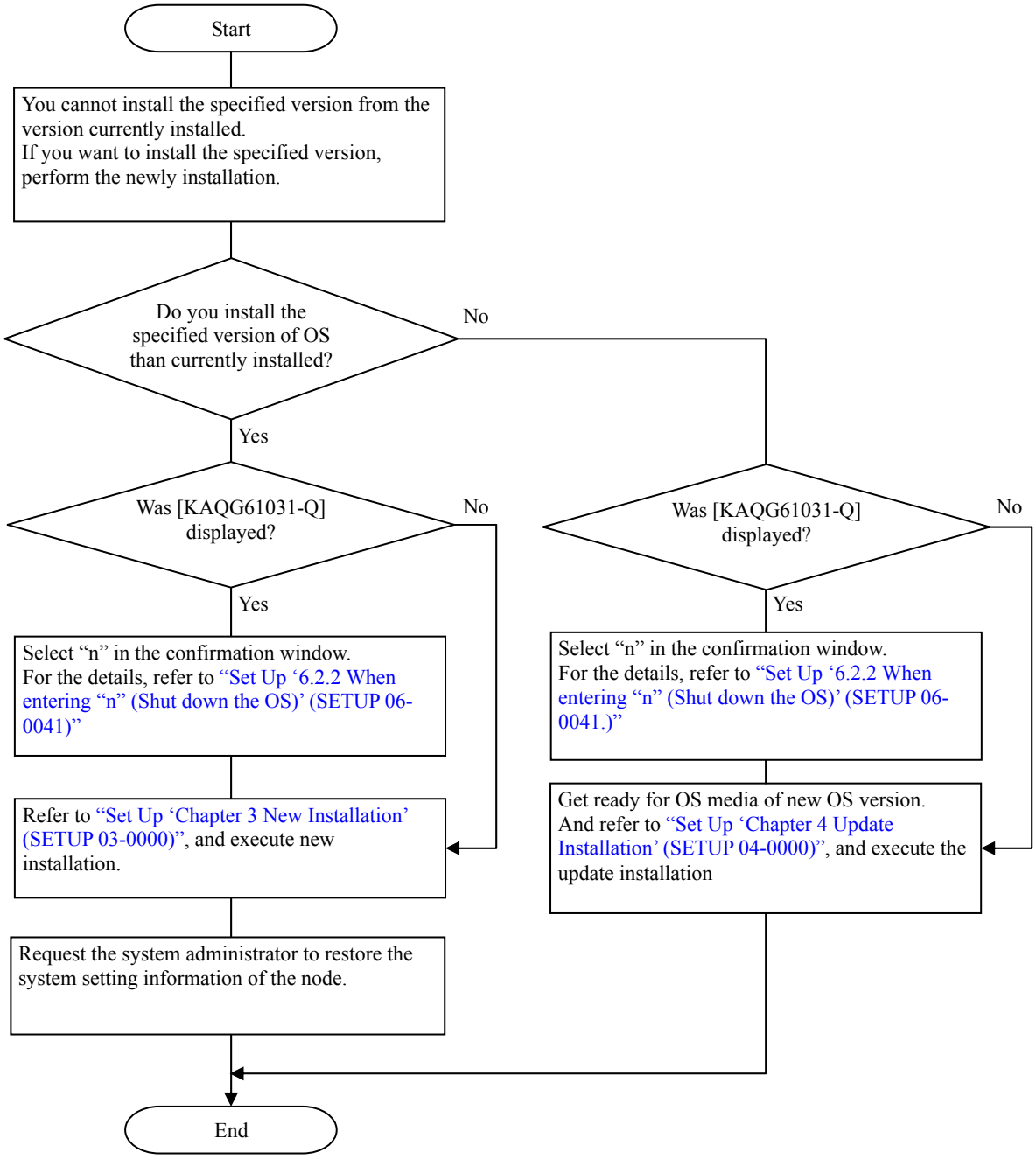

Figure C.2.1-5 Flow of Diagnosis when Checking the Version during Update Installation

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(6) Figure C.2.1-6 shows the flowchart when message IDs described in Table C.2.1-6 are output because the update installation is executed in the state of no OS installed.

Table C.2.1-6 Message ID List (6)

Message ID	KAQG61028-E

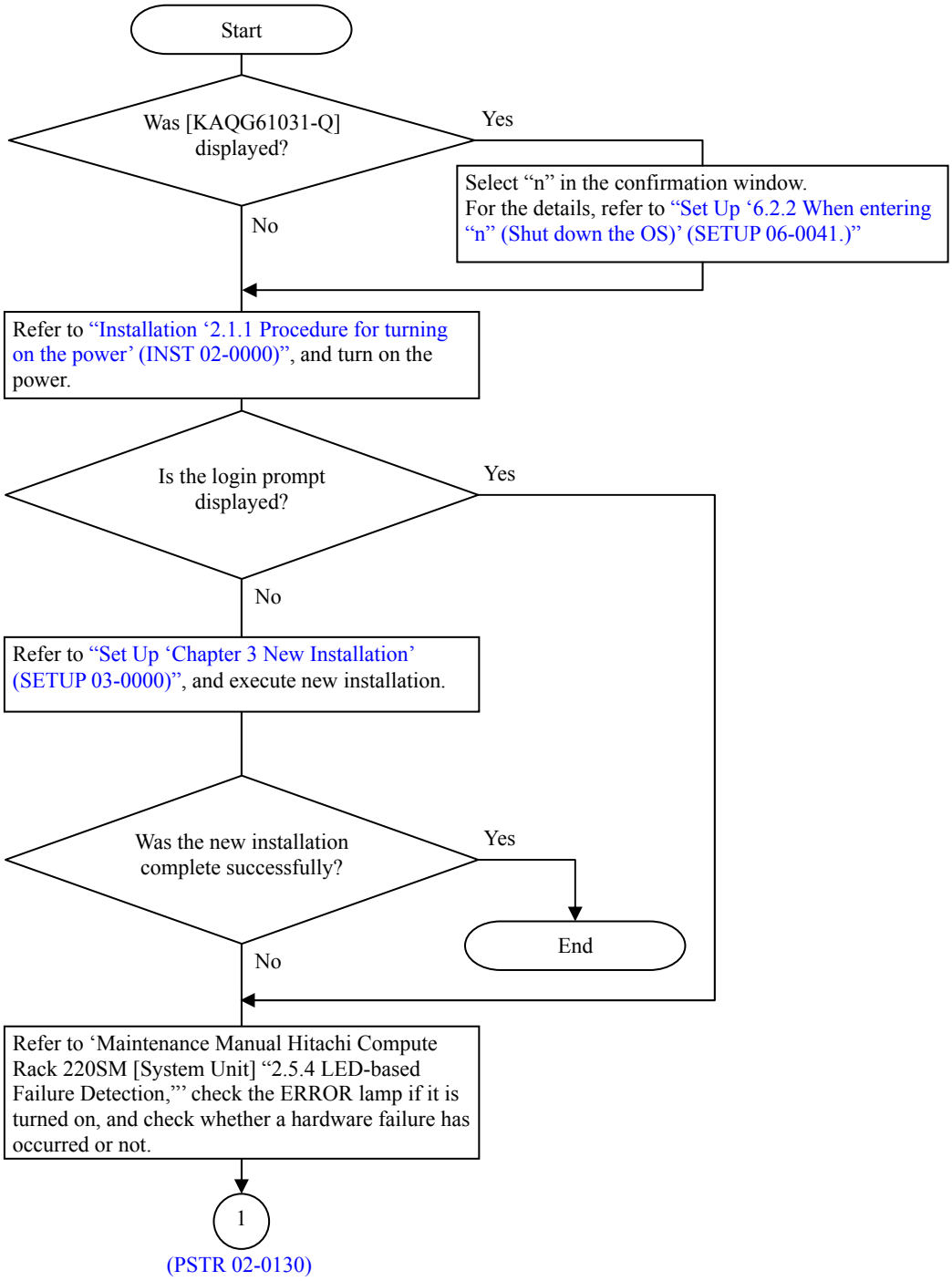

Figure C.2.1-6 Flow of Diagnosis when the Update Installation Failed (1/2)

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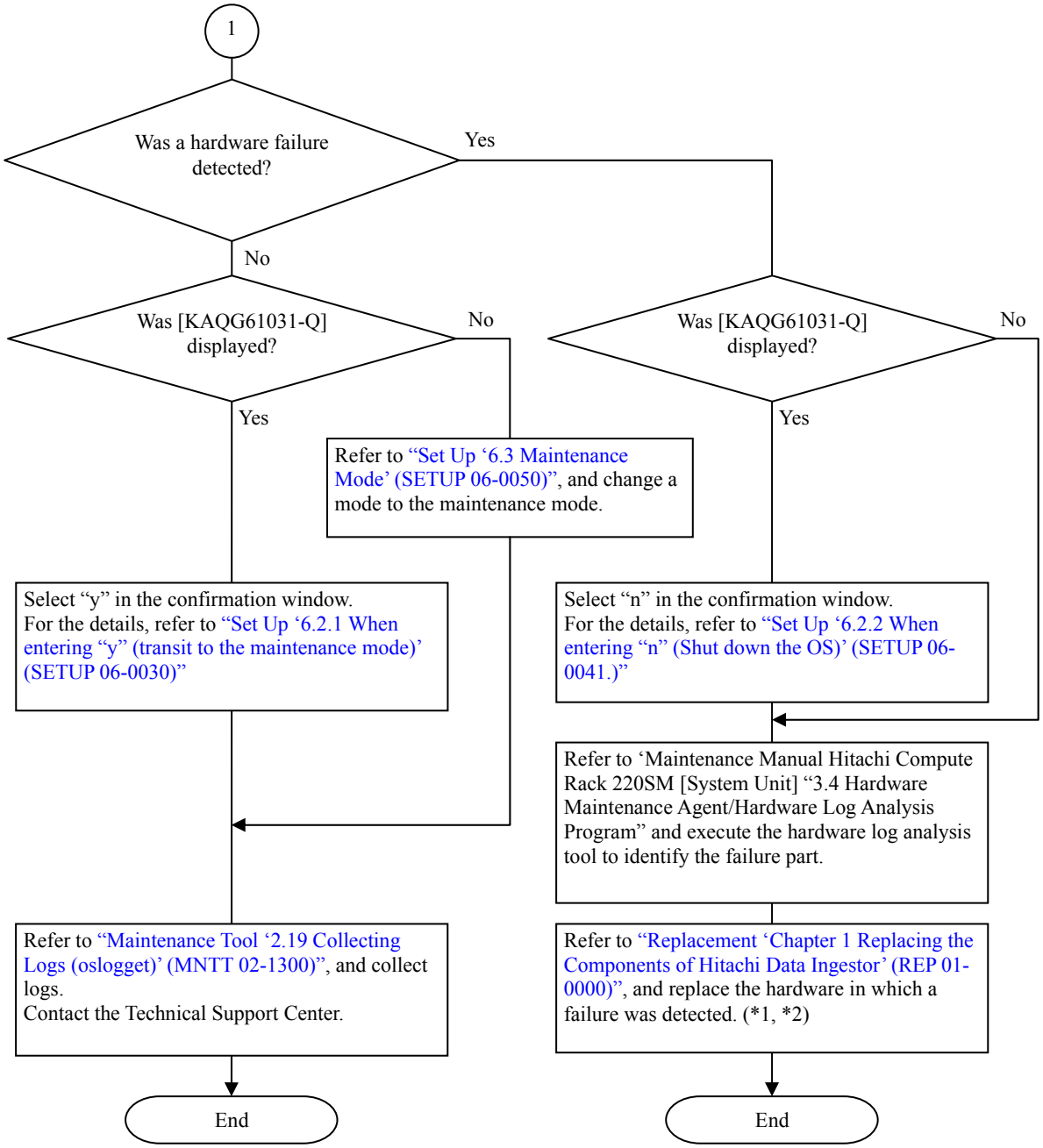

*1: Make sure to collect Simple log by using HATP before the parts replacement.
*2: If the new installation is executed along with the parts replacement, use an install media of the OS of the same version as one verified in operation before the update installation to execute the installation.

Figure C.2.1-6 Flow of Diagnosis when the Update Installation Failed (2/2)

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C.2.2 Determination Procedure when a Failure Occurred

C.2.2.1 Failure determination procedure at the cluster configuration

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C.2.2.2 Failure determination procedure at the single node configuration

In the single node configuration, a failure is determined to either a hardware system failure or a software system failure after checking the power supply. The entire flow of the failure determination is shown below.

NOTE:
- Because there are two configurations (HDI for Cloud configuration and Configuration of single node with spare for Cloud) in the single node configuration, make sure the target configuration before the operation. For the configuration, refer to "Installation '1.1.4 Overall configuration diagram (4) Overall system configuration diagram in the configuration of HDI for Cloud (single node)' (INST 01-0078)".
- This model is not equipped with a DVD drive. Attach an external DVD drive when executing HATP.
- HATP might be used for collecting logs or locating faulty hardware, and be sure to turn off the node before performing HATP.
  Make sure that the CD of HATP is not inserted before turning off the node, or the node cannot be restarted.
- If the OS version 5.1.0-XX and later, and File Version Restore Function is used, "data of the past version directory" might be inaccessible for a moment after the start-up of the resource groups. Contact the system administrator when the resource groups are to be started or restarted.
- If the logical failure is occured on the file system using the Active File Migration or the Large file transfer, the maintenance personnel might not be able to identify the failure location with the failure determination procedure. Before the completion maintenance procedure, inform system administrator that they can start recovering the work space for AFM.

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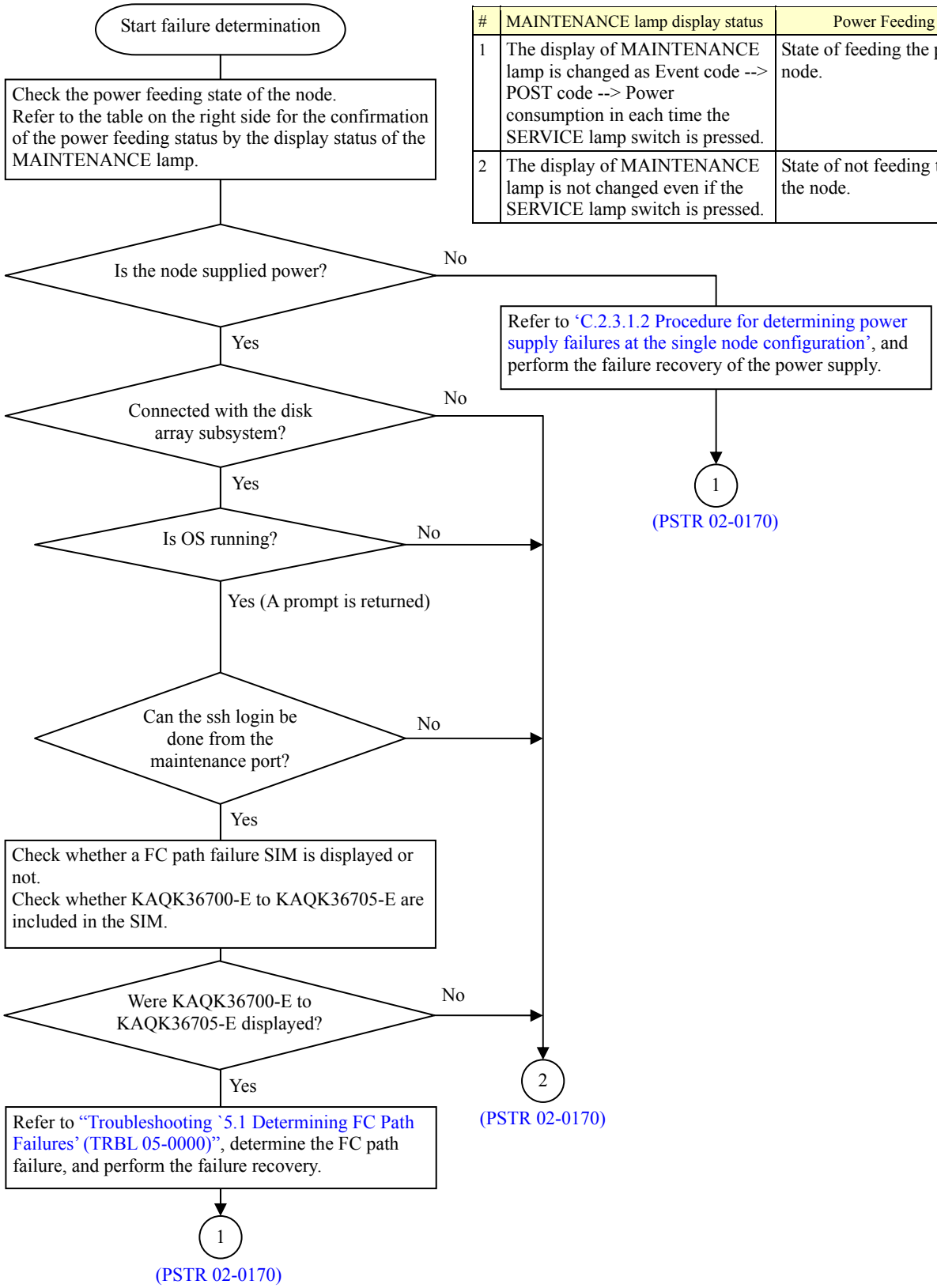

#	MAINTENANCE lamp display status	Power Feeding Status
1	The display of MAINTENANCE lamp is changed as Event code --> POST code --> Power consumption in each time the SERVICE lamp switch is pressed.	State of feeding the power to the node.
2	The display of MAINTENANCE lamp is not changed even if the SERVICE lamp switch is pressed.	State of not feeding the power to the node.

Figure C.2.2.2-1 Failure determination procedure in the single node configuration (1/2)

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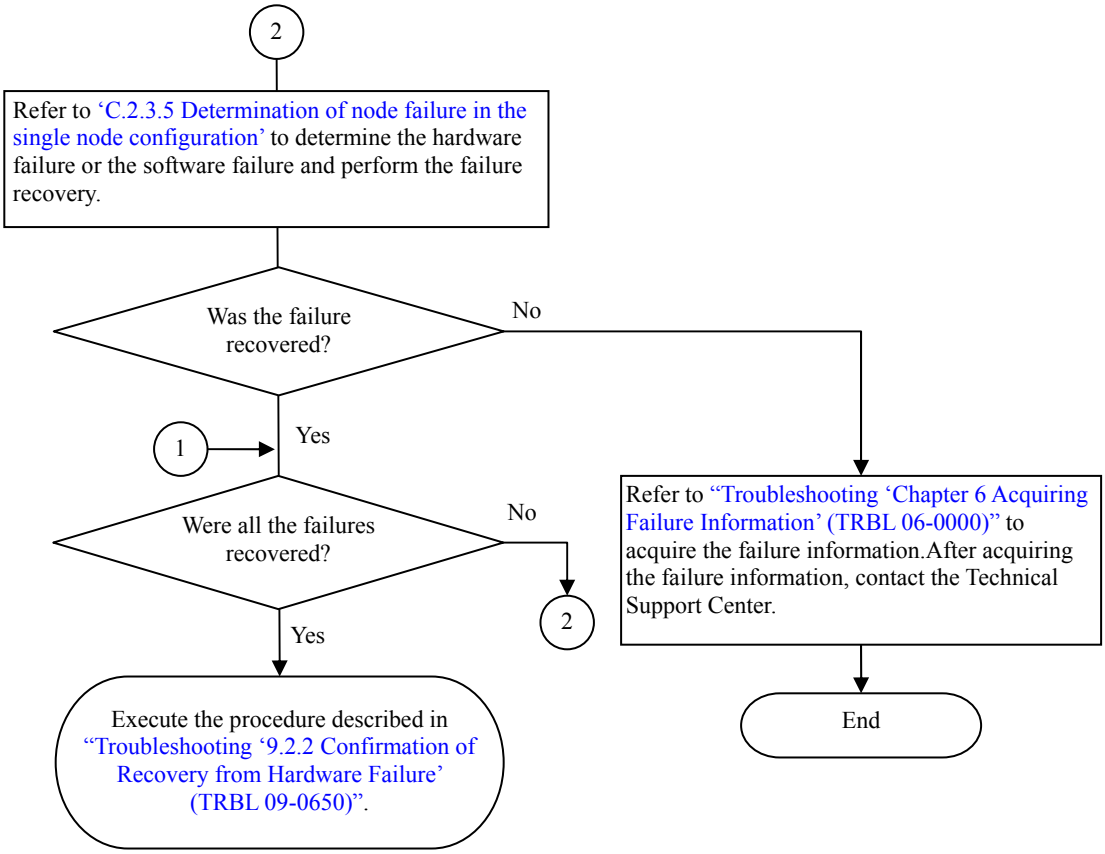

Figure C.2.2.2-1 Failure determination procedure in the single node configuration (2/2)

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C.2.3 Detailed Determination Procedure in Each Failure

C.2.3.1 Procedure for determining power supply failures

C.2.3.1.1 Procedure for determining power supply failures in the cluster configuration

This model does not support the cluster configuration.

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C.2.3.1.2 Procedure for determining power supply failures at the single node configuration

The following flowchart shows the procedure of power supply failures. It is assumed that the power supply lamp does not turn on, blinking in amber light, or a distribution board failure occurred.

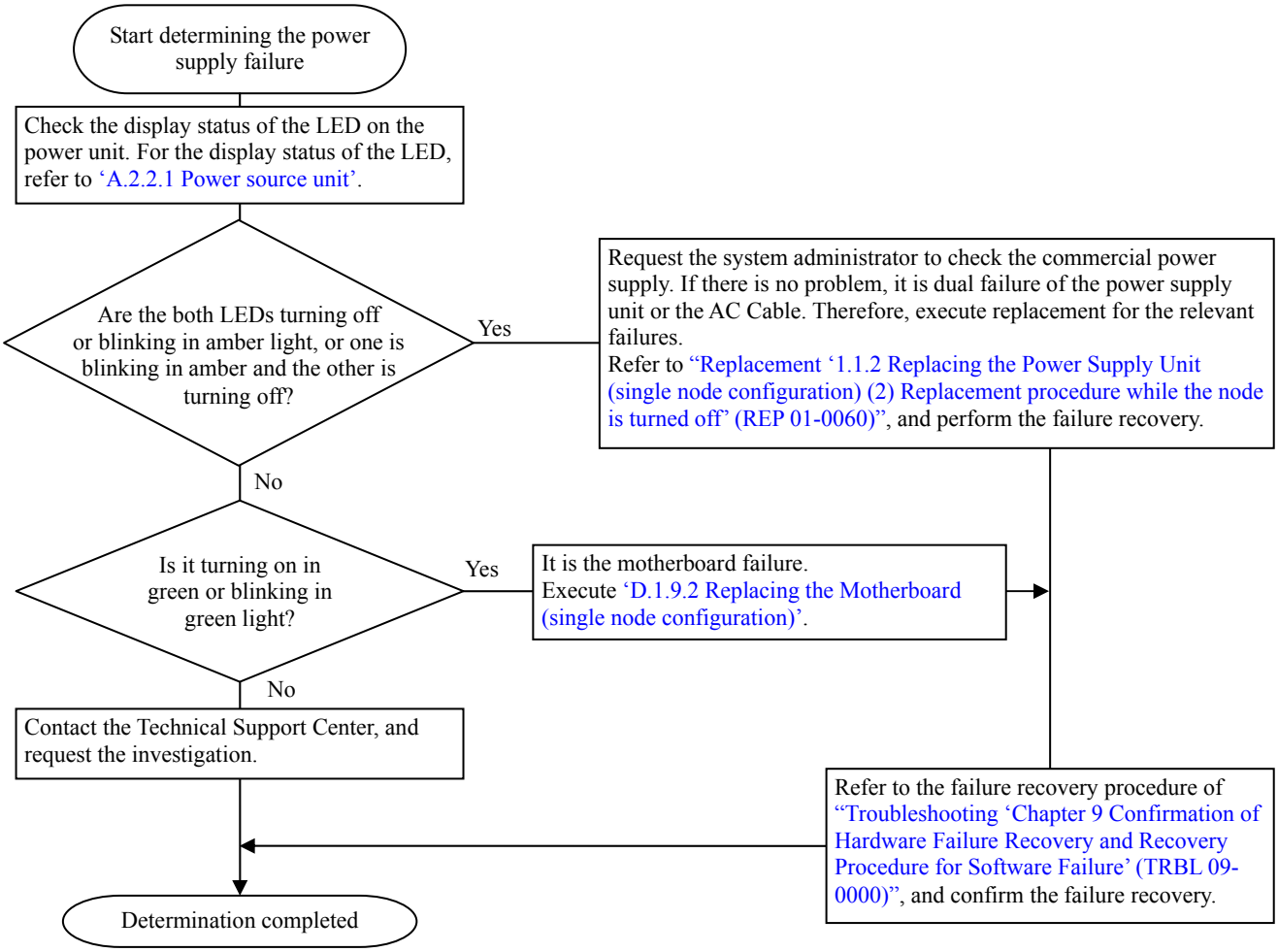

Figure C.2.3.1.2-1 Procedure for determining power supply failures

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C.2.3.2 Determination of management network failure

This model does not support failure determination in the cluster configuration.

C.2.3.2.1 Failure determination by ping command execution result

This model does not support failure determination in the cluster configuration.

C.2.3.2.2 Flow of management network failure determination

This model does not support failure determination in the cluster configuration.

C.2.3.2.3 Failure determination in case of node outage

This model does not support failure determination in the cluster configuration.

C.2.3.3 Determining the node failure when no failover occurs

This model does not support failure determination in the cluster configuration.

C.2.3.4 Determining the node failure when failover occurred

This model does not support failure determination in the cluster configuration.

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C.2.3.5 Determination of node failure in the single node configuration

The following explains the failure determination and the failure part in the single node configuration.

Table C.2.3.5-1 Table of Determination matrix of the node operating status

Ping for the BMC port (*1)	OS starts up confirmation (*2)	ssh login for the maintenance port (*3)	Result of the determination
Y	Y	Y	node in operation
		N	node in operation (Maintenance port failure)
	N	—	node down
N	—	Y	node in operation (BMC failure)
		N	Ask the system administrator if the data can be accessed.

*1: Connect directly the BMC port to the maintenance PC with a LAN cable, and execute ping command for the BMC port.

*2: Check if the OS starts from the remote console of BMC. For the details, refer to "Set Up '1.4 Connection Confirmation of the Remote Console' (SETUP 01-0010)".

*3: Connect directly the maintenance port to the maintenance PC with a LAN cable, and check if the ssh login can be done. For the details, refer to "Maintenance Tool '1.3 Procedures for Operating Commands' (MNTT 01-0200)".

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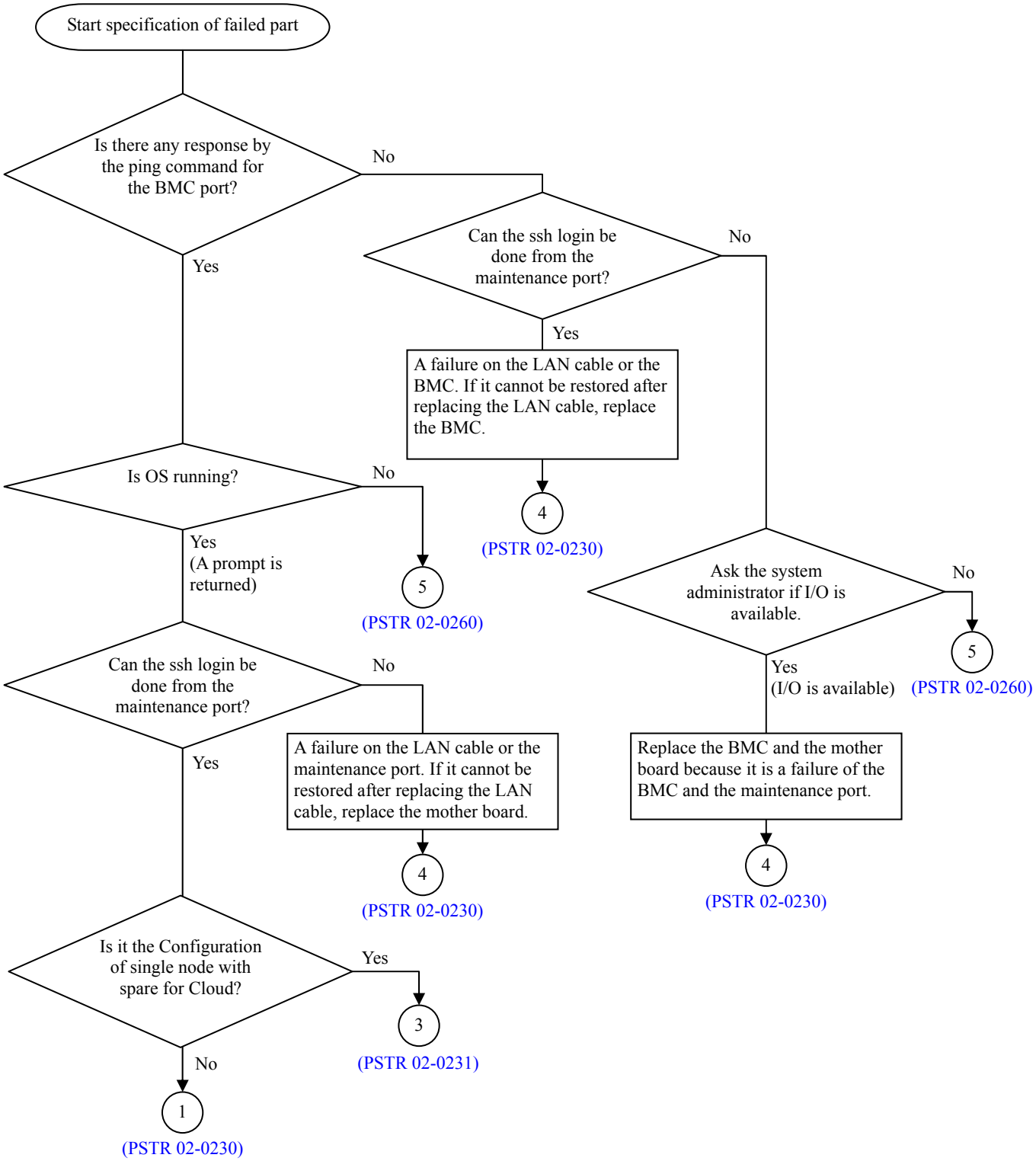

Figure C.2.3.5-1 Determining the node failure in the single node configuration (1/9)

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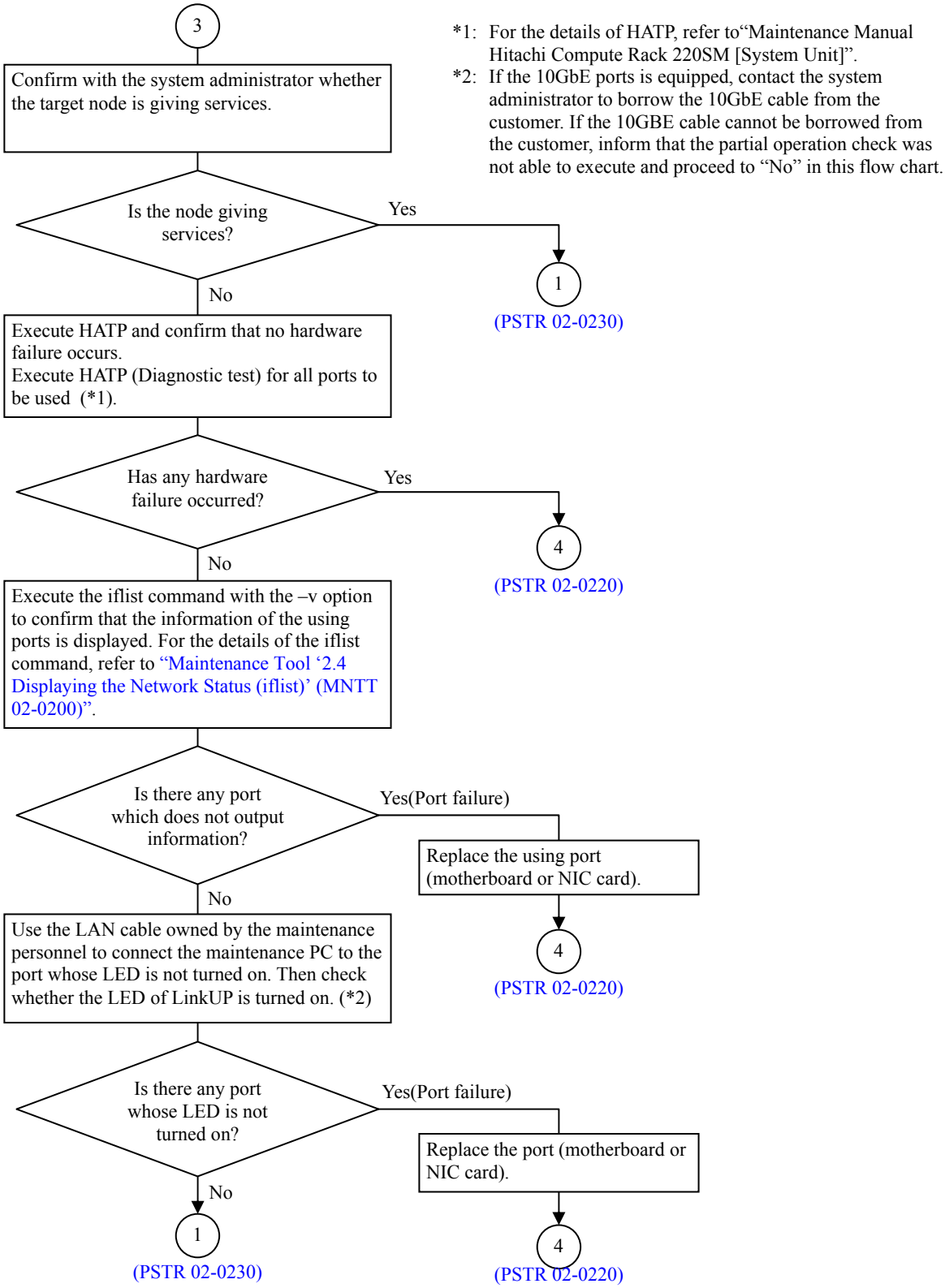

*1: For the details of HATP, refer to"Maintenance Manual Hitachi Compute Rack 220SM [System Unit]".

*2: If the 10GbE ports is equipped, contact the system administrator to borrow the 10GbE cable from the customer. If the 10GBE cable cannot be borrowed from the customer, inform that the partial operation check was not able to execute and proceed to "No" in this flow chart.

Figure C.2.3.5-1 Determining the node failure in the single node configuration (2/9)

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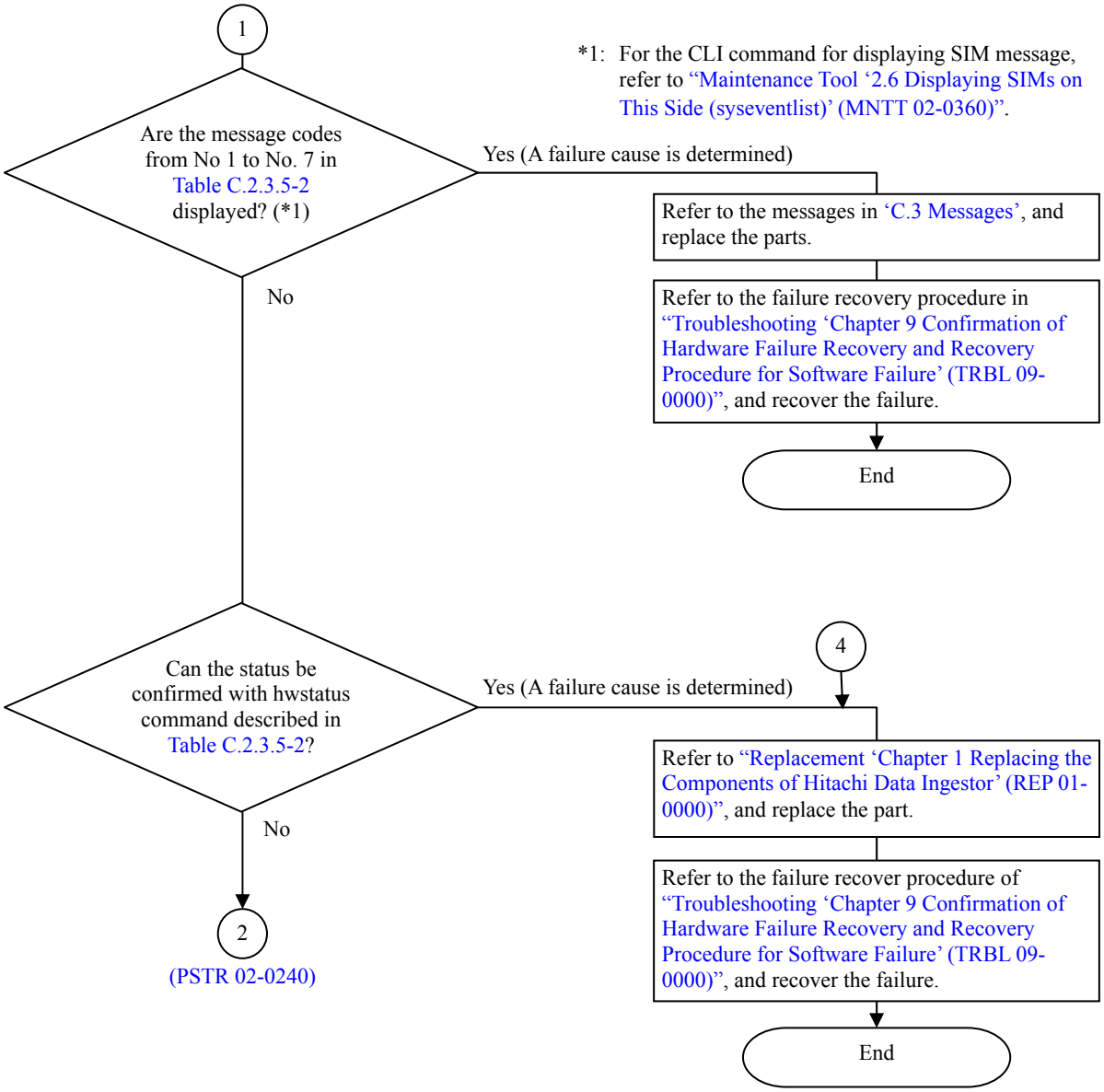

Figure C.2.3.5-1 Determining the node failure in the single node configuration (3/9)

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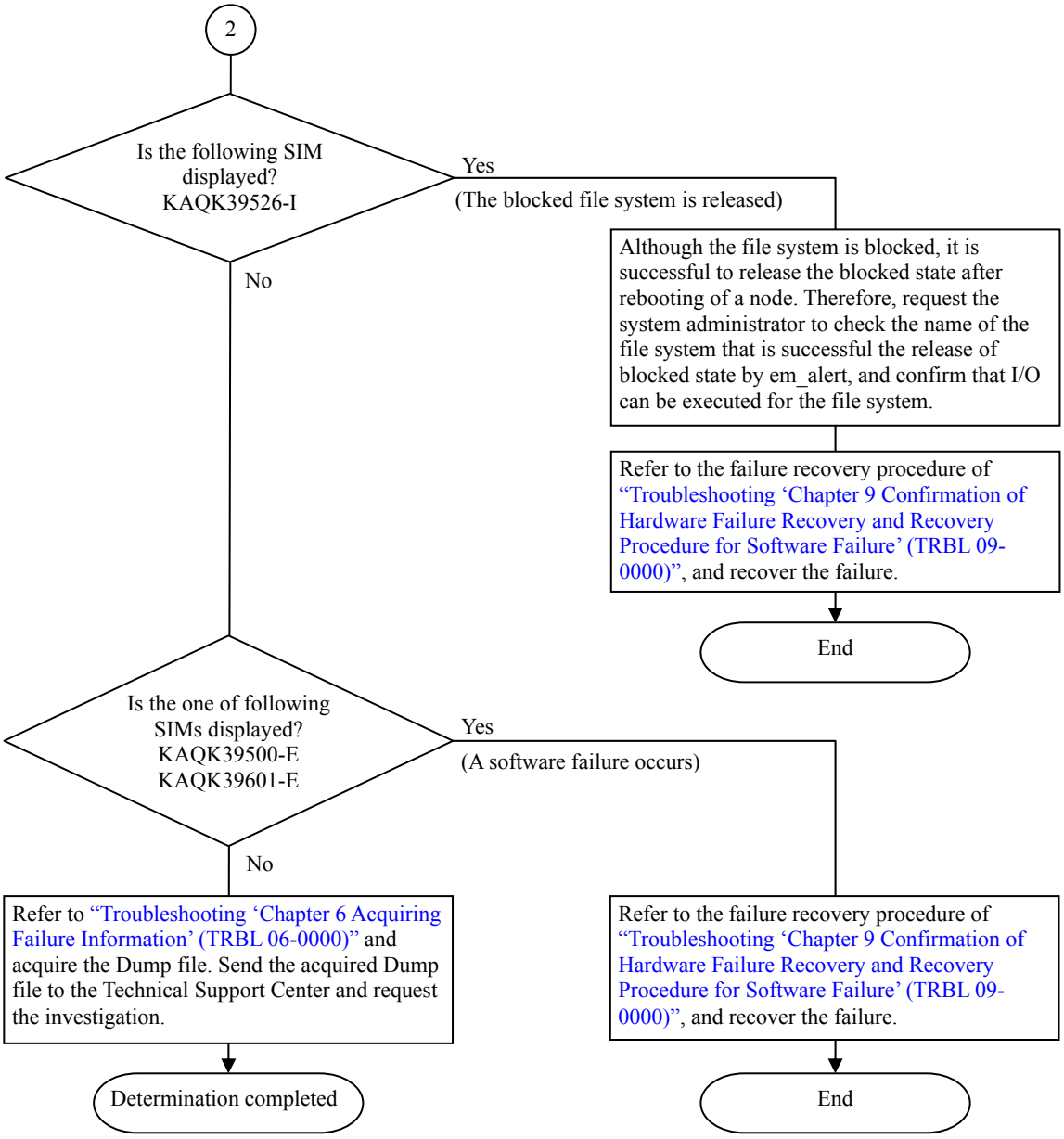

Figure C.2.3.5-1 Determining the node failure in the single node configuration (4/9)

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Table C.2.3.5-2 Failed parts shown by SIM or LCD

#	SIM	Checking the status by the hwstatus command (*1)	Failed part
1	KAQG81003-W	Is the port status “Link down”? (*5)	On-board port, Extension NIC port, or cables (*2)
2	KAQK30801-E	—	Determine a failure part from the RC described in SIM and the continuous log (*3)
3	KAQK39504-E	Are the statuses of all ports of NIC “Link down”? (*5)	—
4	KAQK36504-W	Is the statuses of the port “Link down”? (*5)	A port or a cable described in the SIM.
5	KAQK37525-E	—	RAID card
6	KAQK39527-E	—	Pool exhaustion (*4)
7	—	Is the status of BMC “Unknown!”?	BMC

*1: For the hwstatus command, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus)’.
*2: When it is not recovered even if the cable is replaced, it is a port failure.
*3: For identifying a failure part from the RC and the continuous log, refer to “Maintenance Manual Hitachi Compute Rack 220SM [System Unit]”.
*4: Ask the system administrator to recover the pool exhaustion.
*5: If the node is a Configuration of single node with spare for Cloud and has not been giving services, SIM is output as a LAN cable is intentionally unplugged. In this case, proceed to “No” in the flow chart.

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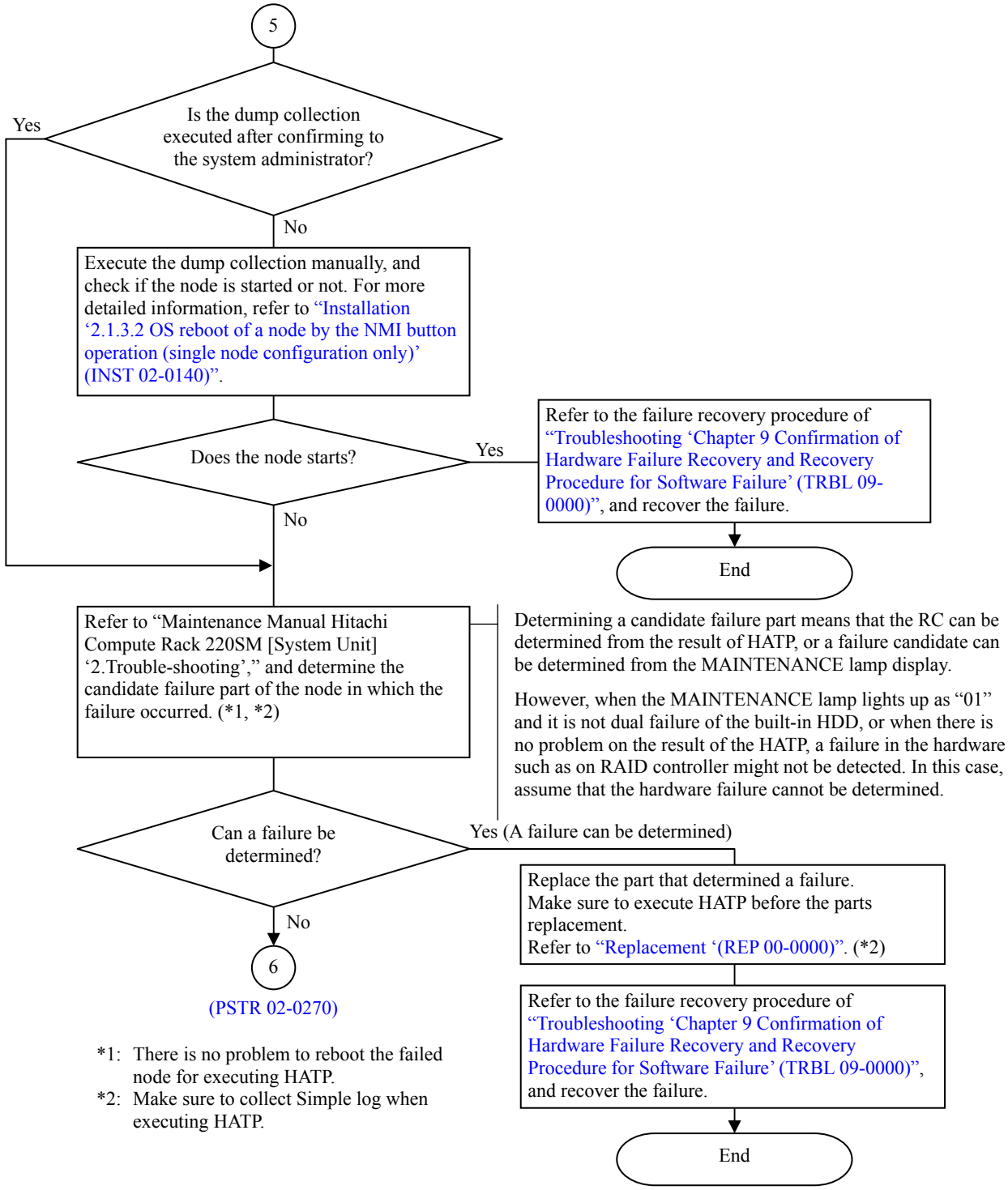

Figure C.2.3.5-1 Determining the node failure in the single node configuration (5/9)

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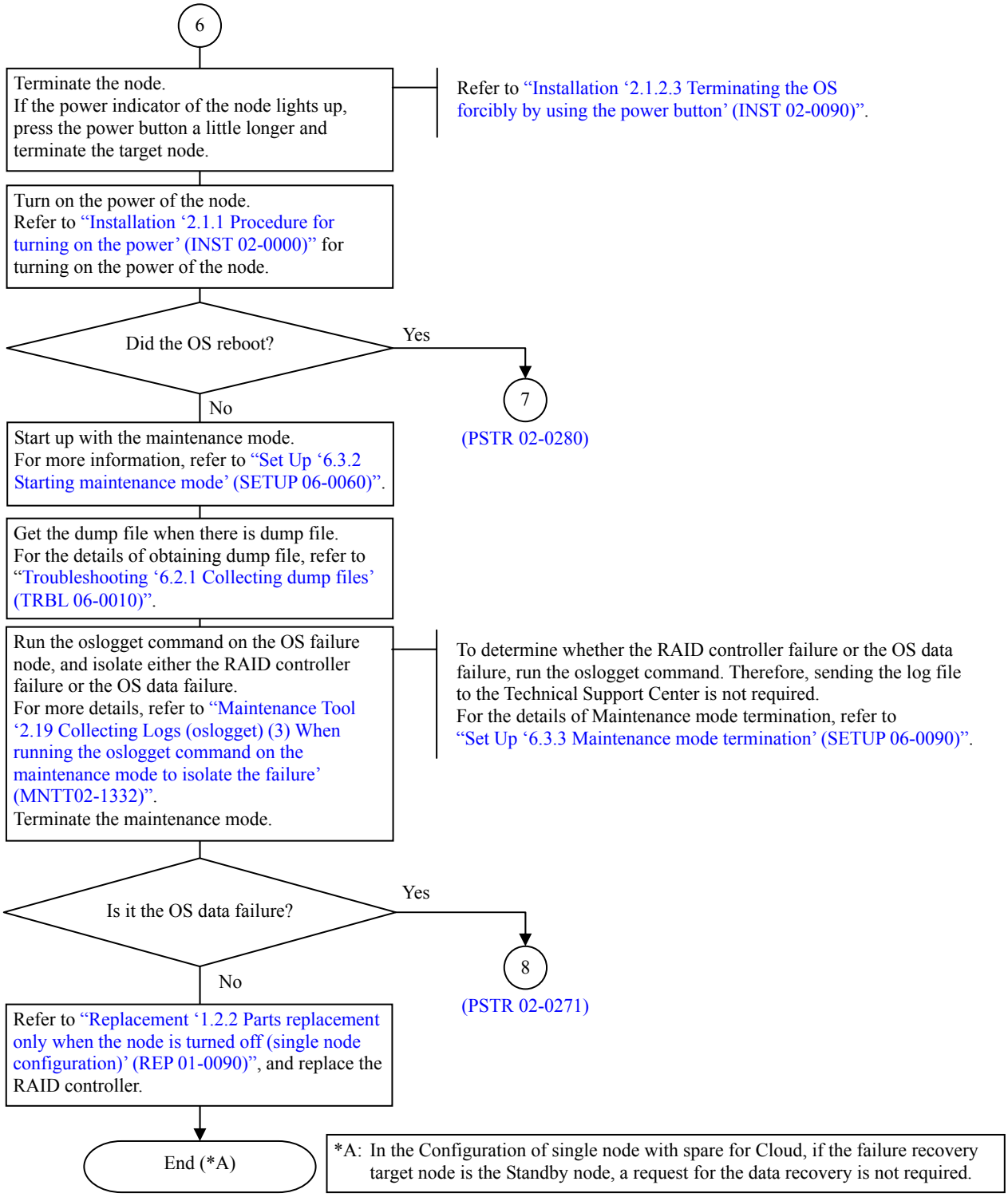

Figure C.2.3.5-1 Determining the node failure in the single node configuration (6/9)

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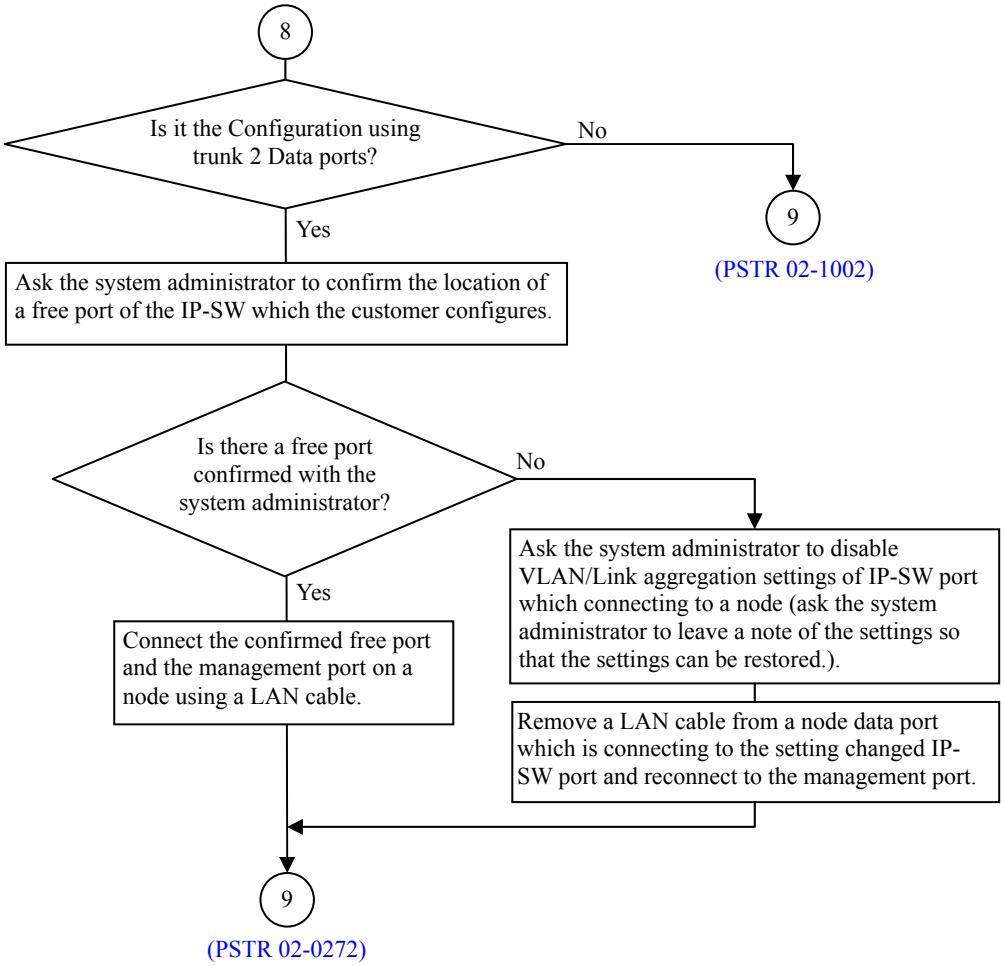

Figure C.2.3.5-1 Determining the node failure in the single node configuration (7/9)

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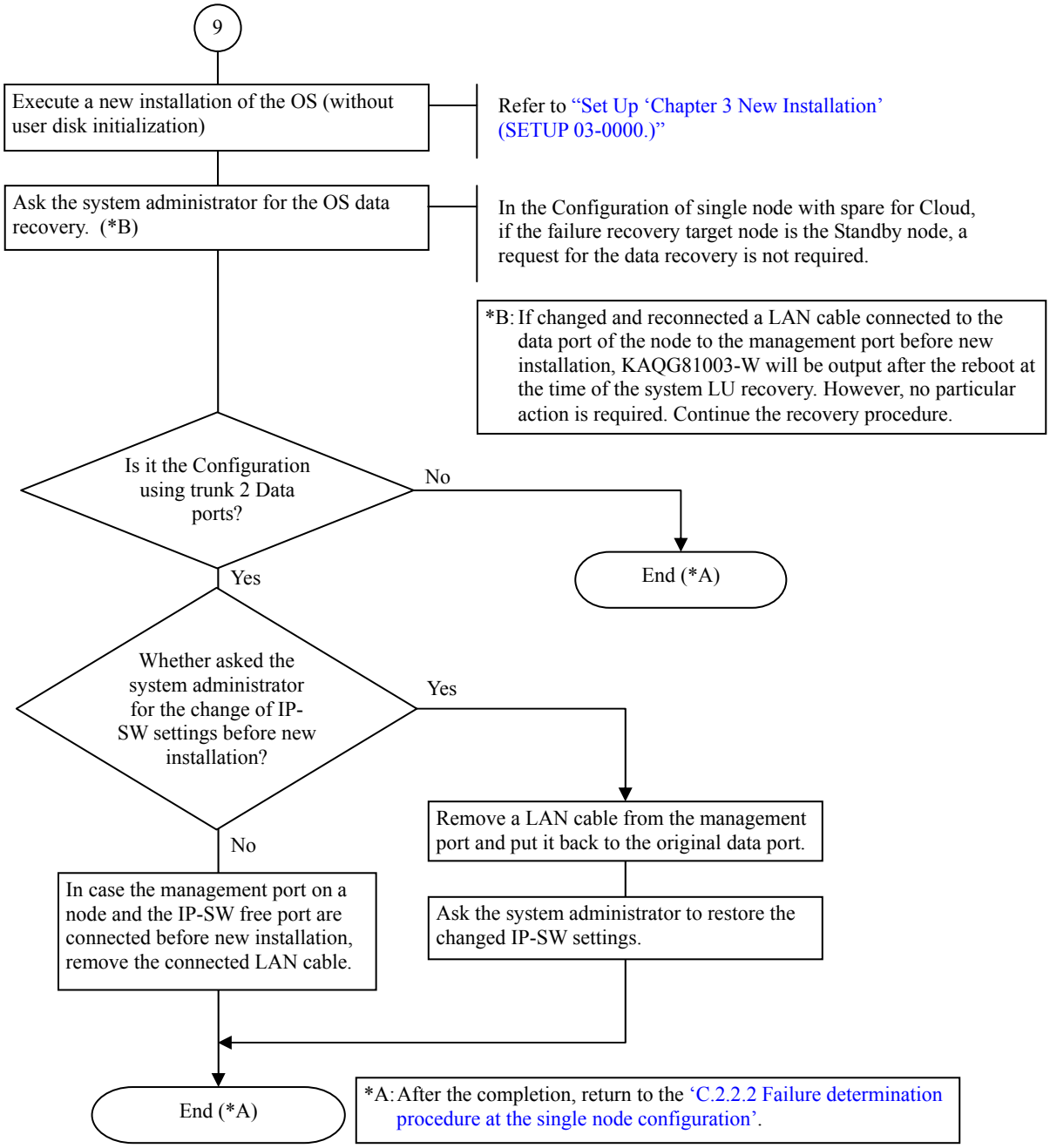

Figure C.2.3.5-1 Determining the node failure in the single node configuration (8/9)

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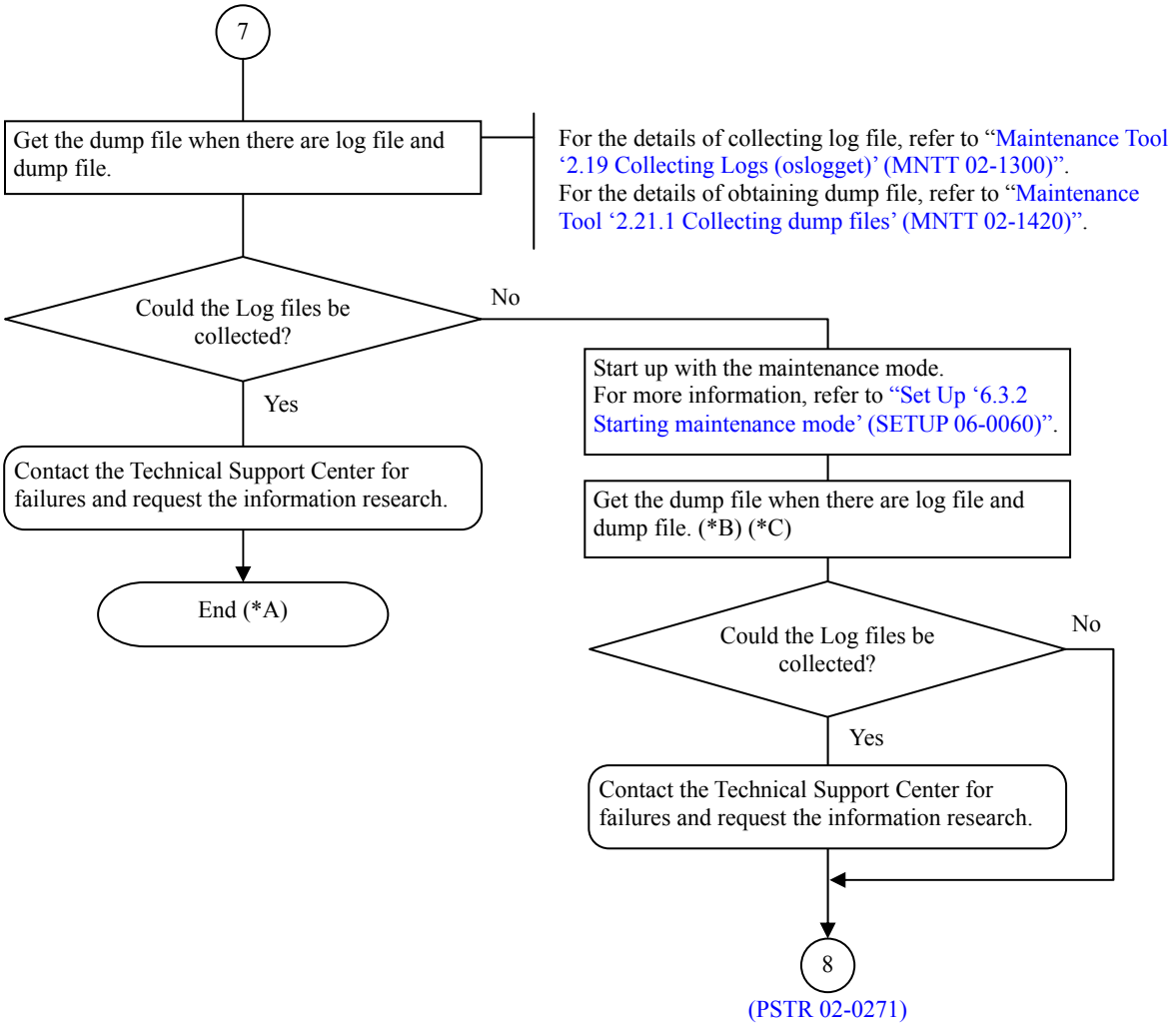

*A: After the completion, return to the 'C.2.2.2 Failure determination procedure at the single node configuration'.
*B: For the details of collecting log file, refer to "Maintenance Tool '2.19 Collecting Logs (oslogget)' (MNTT 02-1300)".
For the details of obtaining dump file, refer to "Maintenance Tool '2.21.3 Confirm the existence of unconverted dump file (dumpcheck)' (MNTT 02-1461)".
*C: For the details of Maintenance mode termination, refer to "Set Up '6.3.3 Maintenance mode termination' (SETUP 06-0090)".

Figure C.2.3.5-1 Determining the node failure in the single node configuration (9/9)

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C.2.3.6 Determination of network failure

This section shows troubleshooting of SIM message from which it is difficult to determine a failure part in the case of displaying SIM about the network failure.

(1) In the case of the KAQG81003-W

Describe troubleshooting procedure as follow in the case of the "KAQG81003-W Trunking driver: One or more subdevices are down. <*master-device-name*>:<*subdevice-name*>,<*subdevice-name*>…" was displayed.

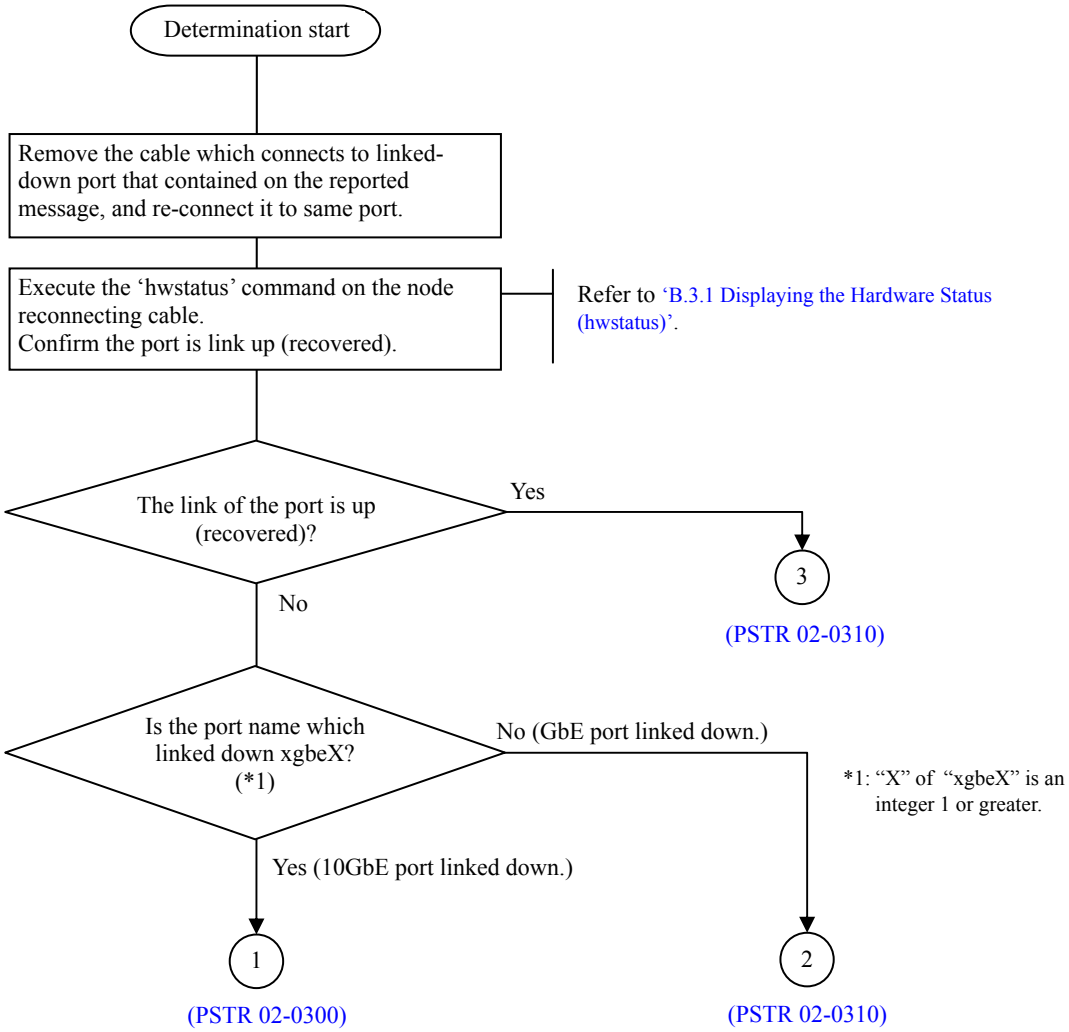

Figure C.2.3.6-1 Determination of network failure (KAQG81003-W) (1/3)

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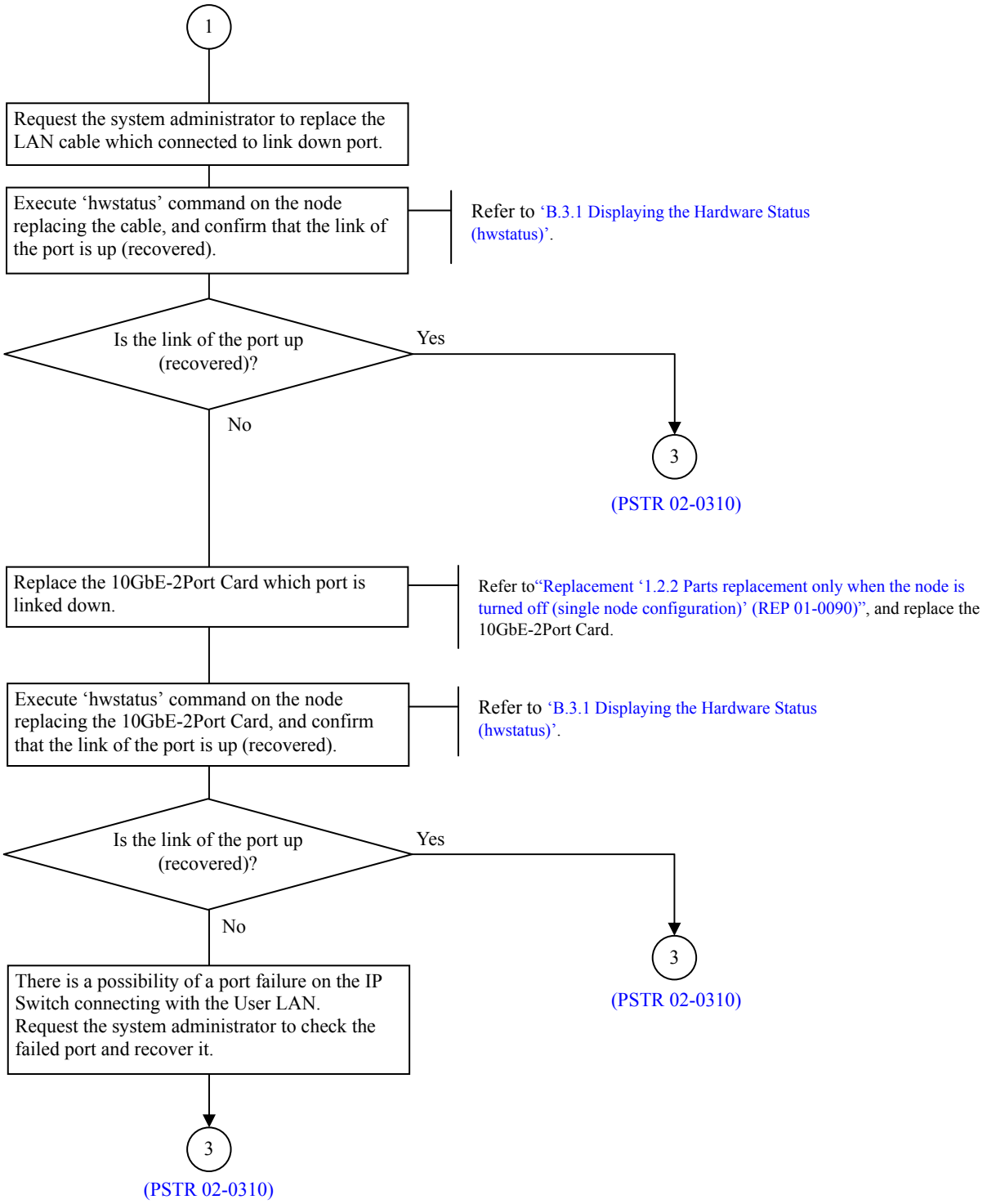

Figure C.2.3.6-1 Determination of network failure (KAQG81003-W) (2/3)

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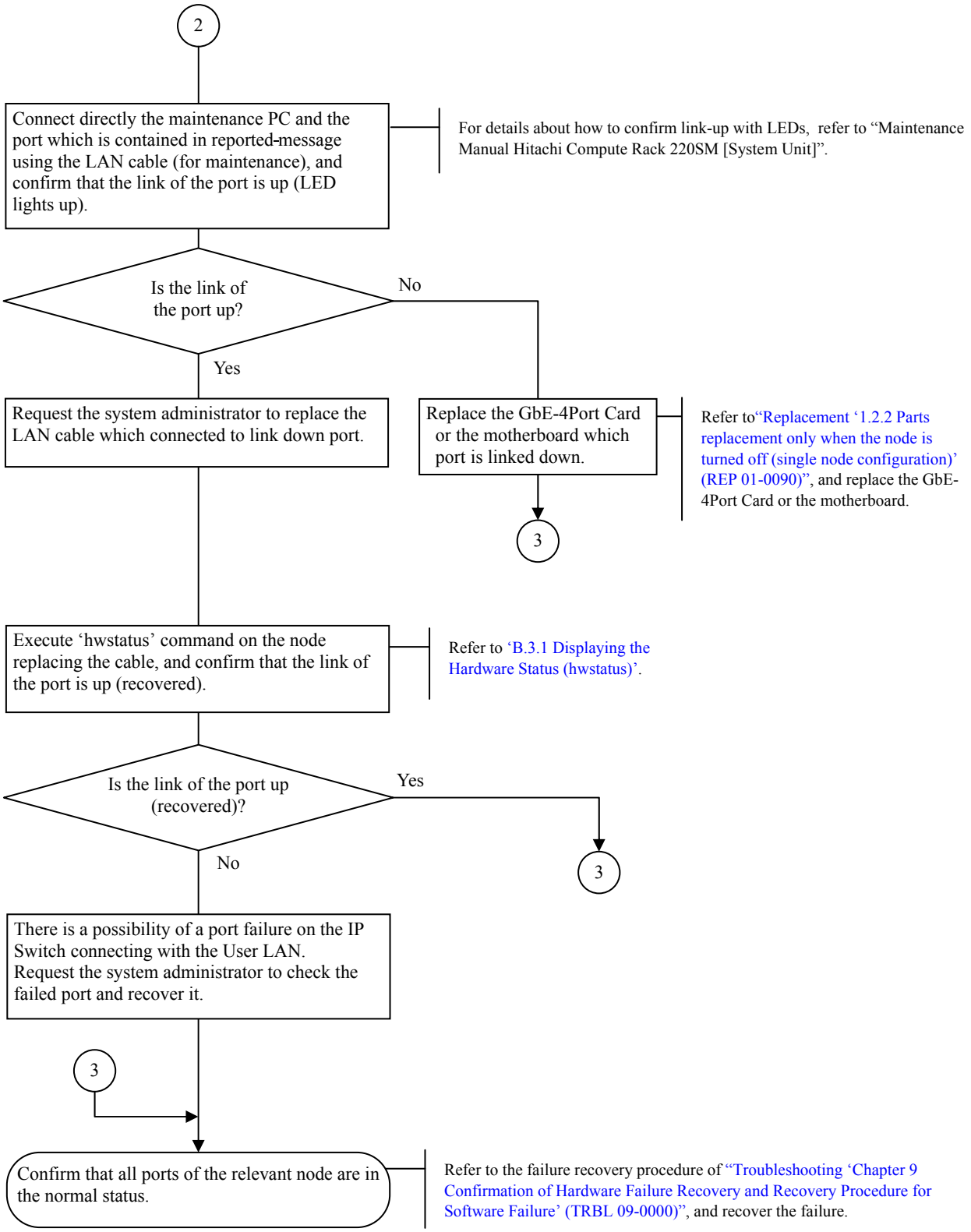

Figure C.2.3.6-1 Determination of network failure (KAQG81003-W) (3/3)

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(2) In the case of the KAQK36504-W

Describe troubleshooting procedure as follow in the case of the “KAQK36504-W NIC: Link down detected(<*interface-name*>)” was displayed.

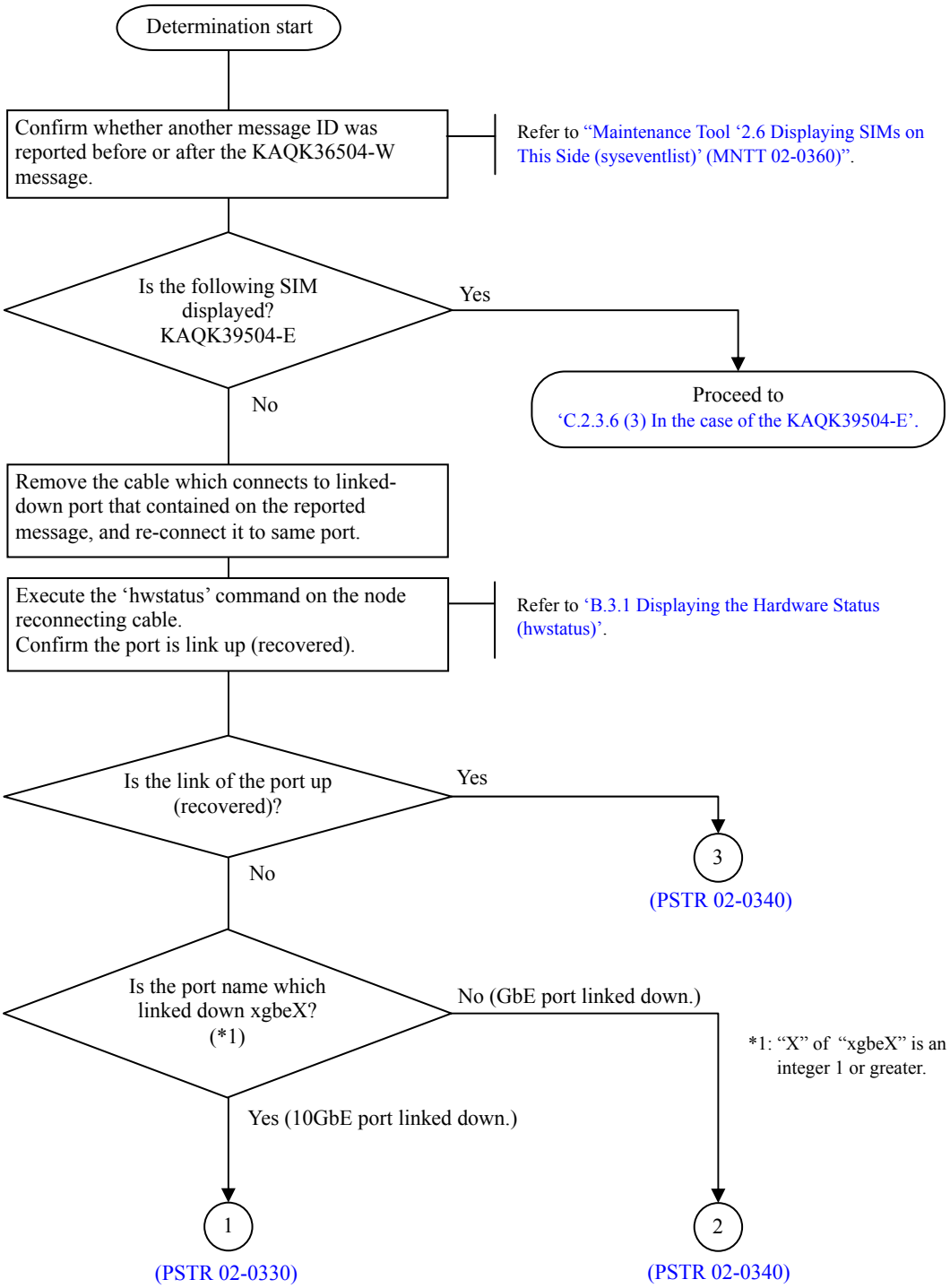

Figure C.2.3.6-2 Determination of network failure (KAQK36504-W) (1/3)

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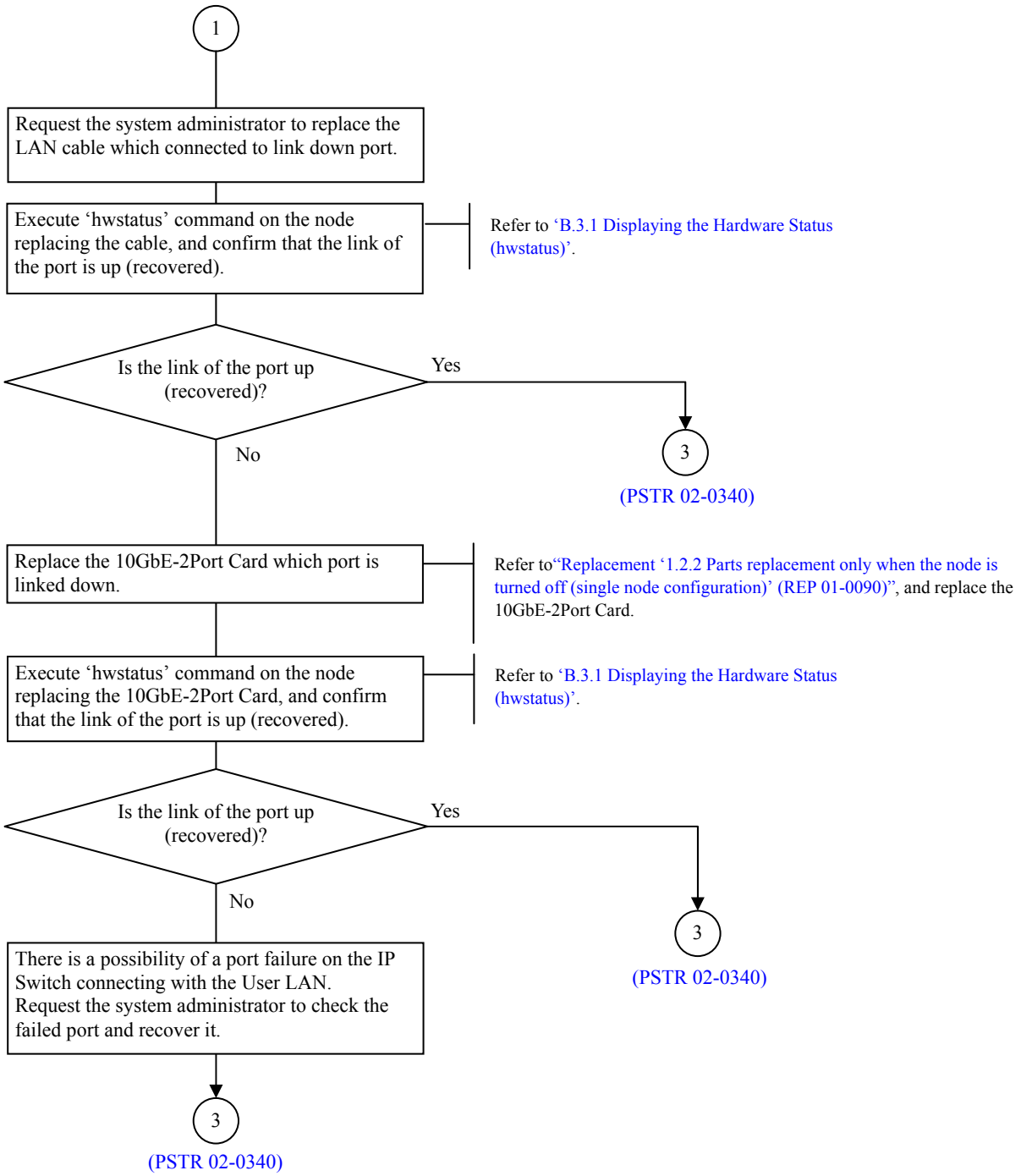

Figure C.2.3.6-2 Determination of network failure (KAQK36504-W) (2/3)

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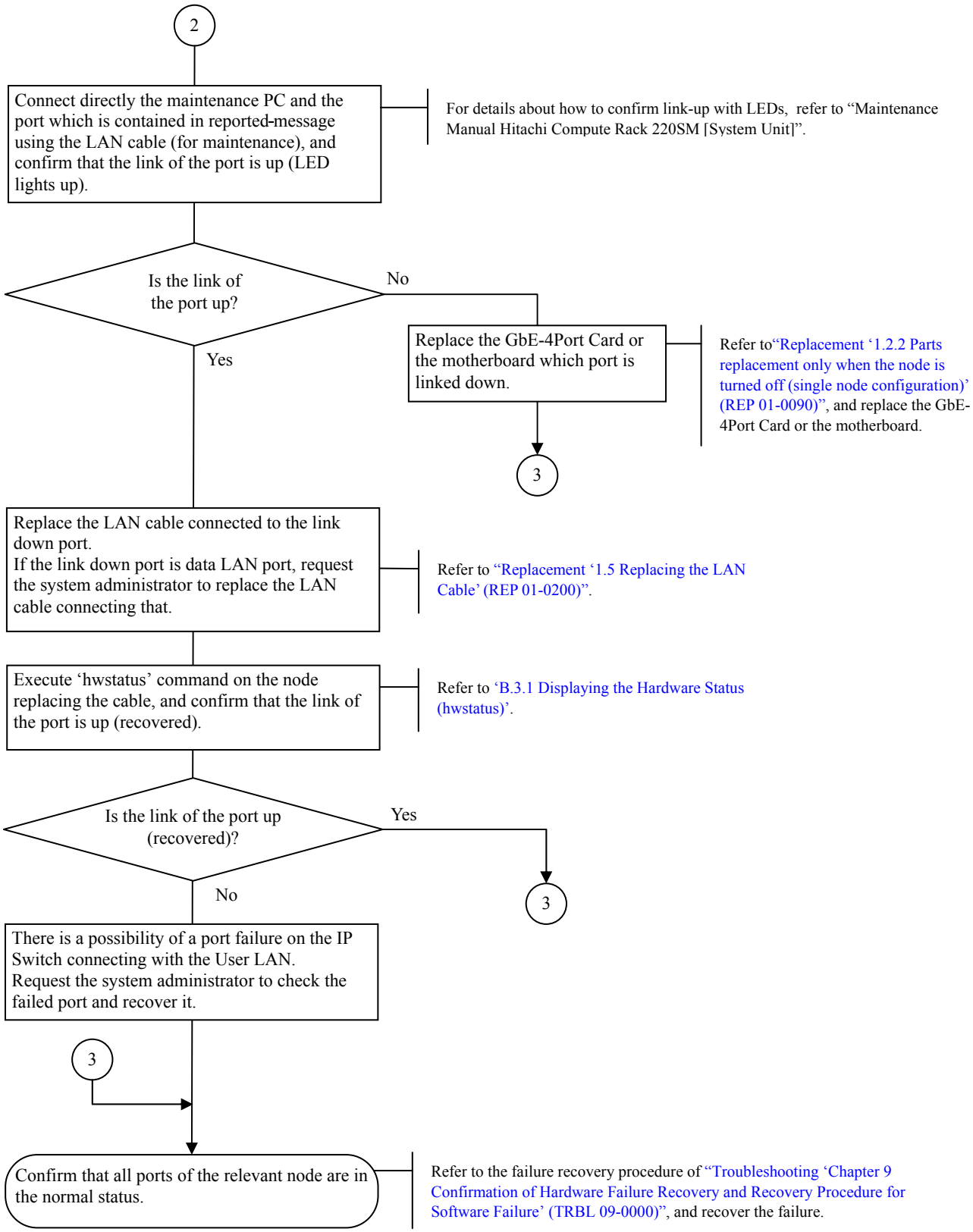

Figure C.2.3.6-2 Determination of network failure (KAQK36504-W) (3/3)

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(3) In the case of the KAQK39504-E

Describe troubleshooting procedure as follow in the case of the “KAQK39504-E Link down in Front-end LAN.” was displayed.

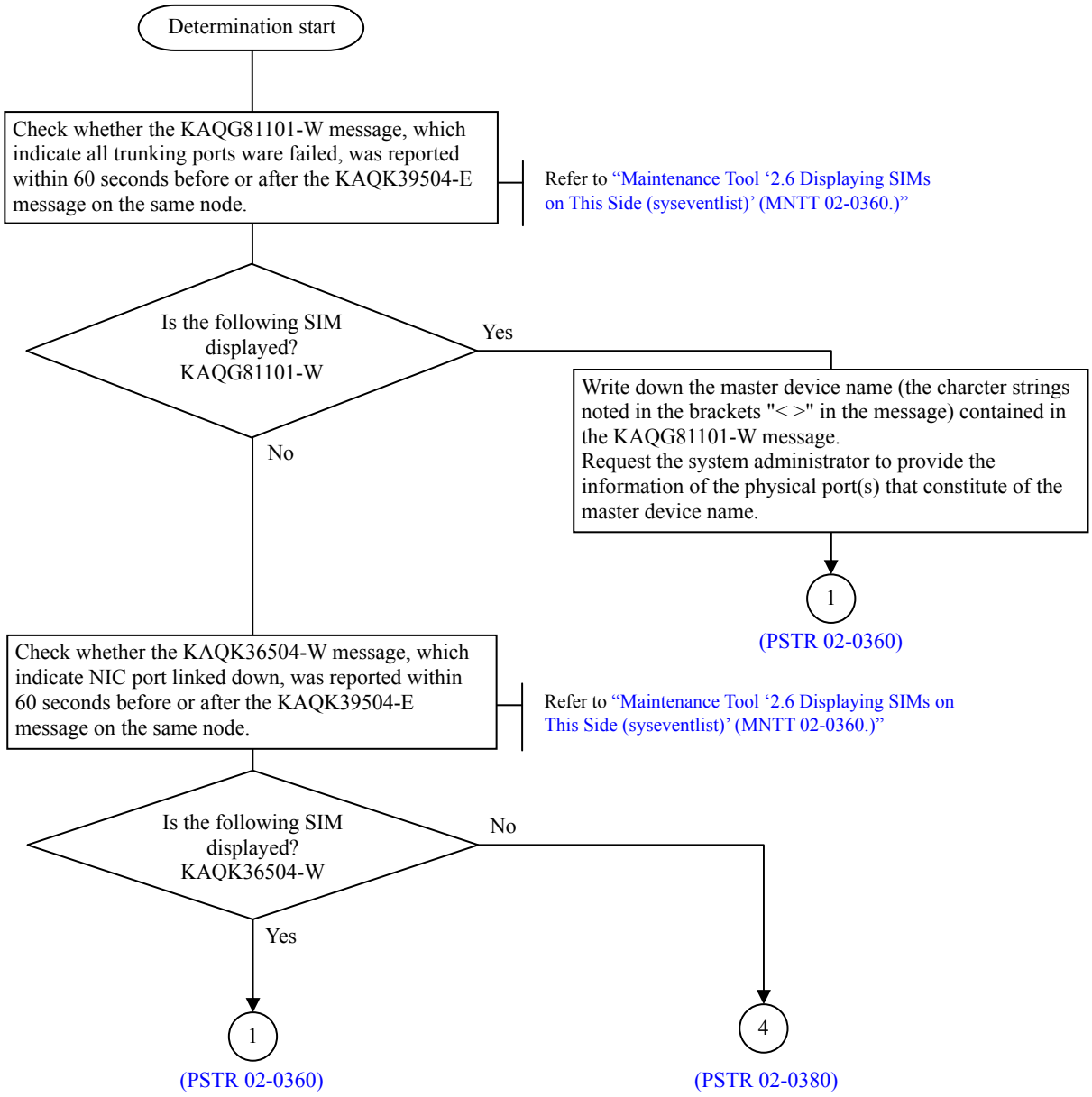

Figure C.2.3.6-3 Determination of network failure (KAQK39504-E) (1/4)

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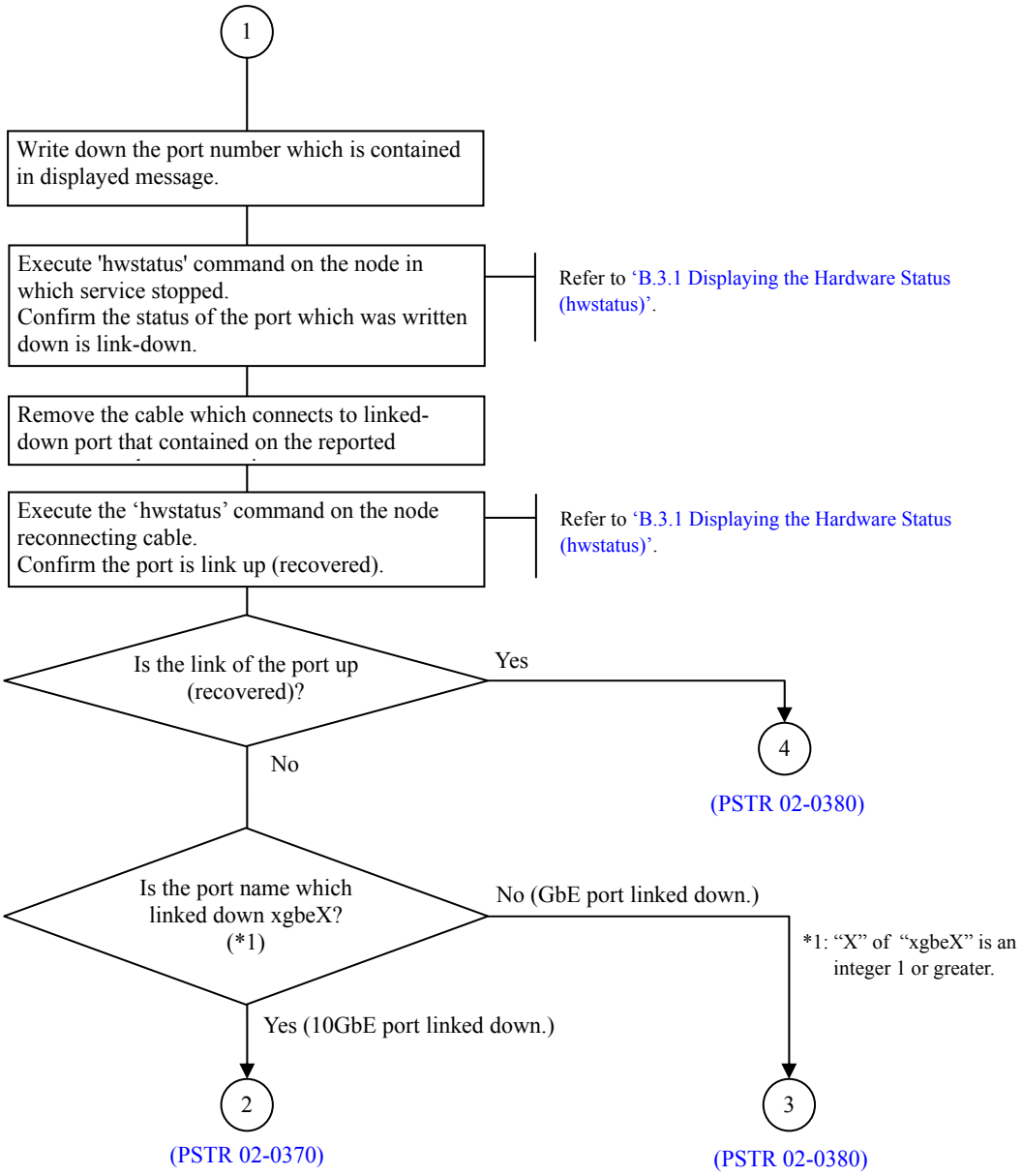

Figure C.2.3.6-3 Determination of network failure (KAQK39504-E) (2/4)

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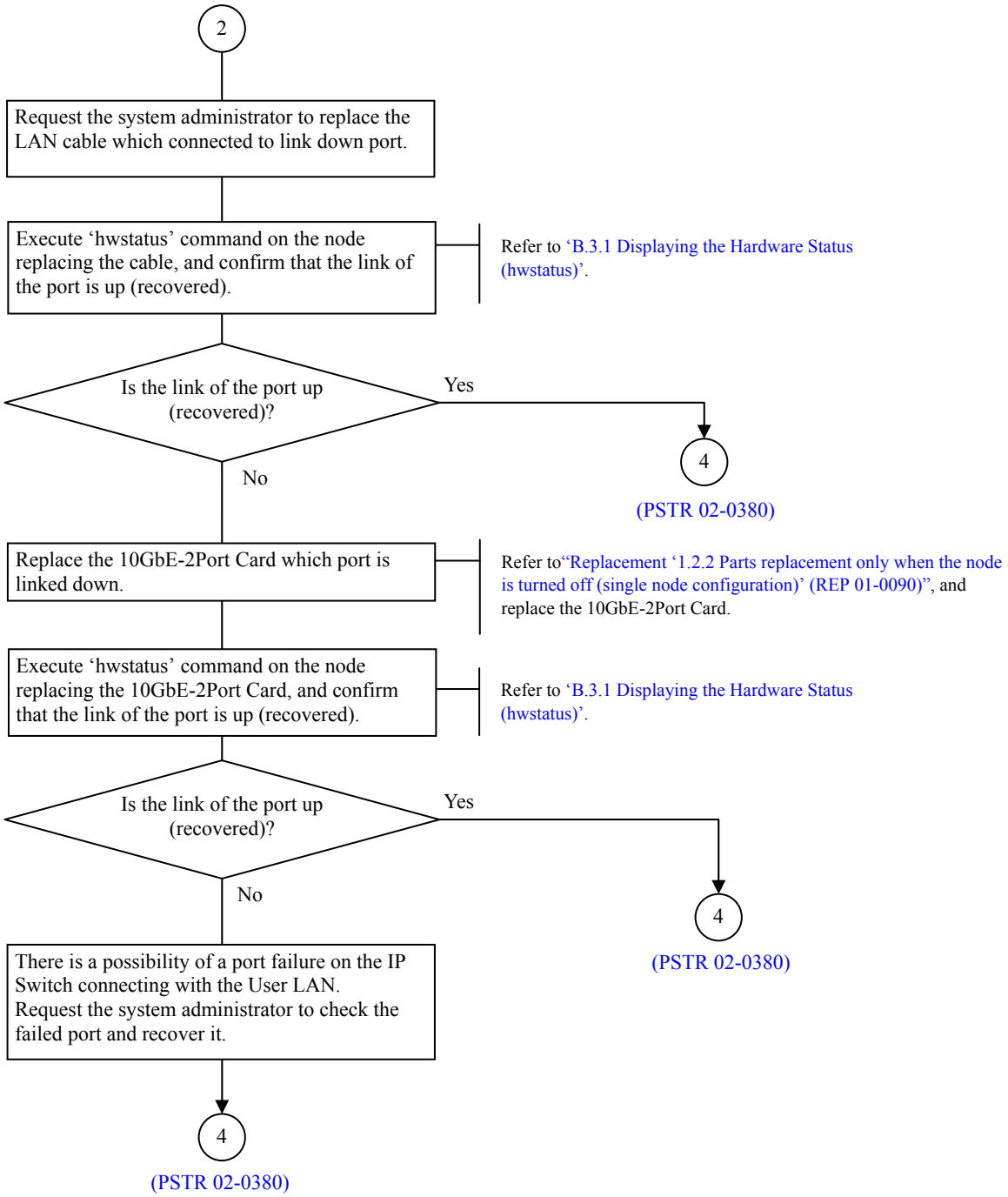

Figure C.2.3.6-3 Determination of network failure (KAQK39504-E) (3/4)

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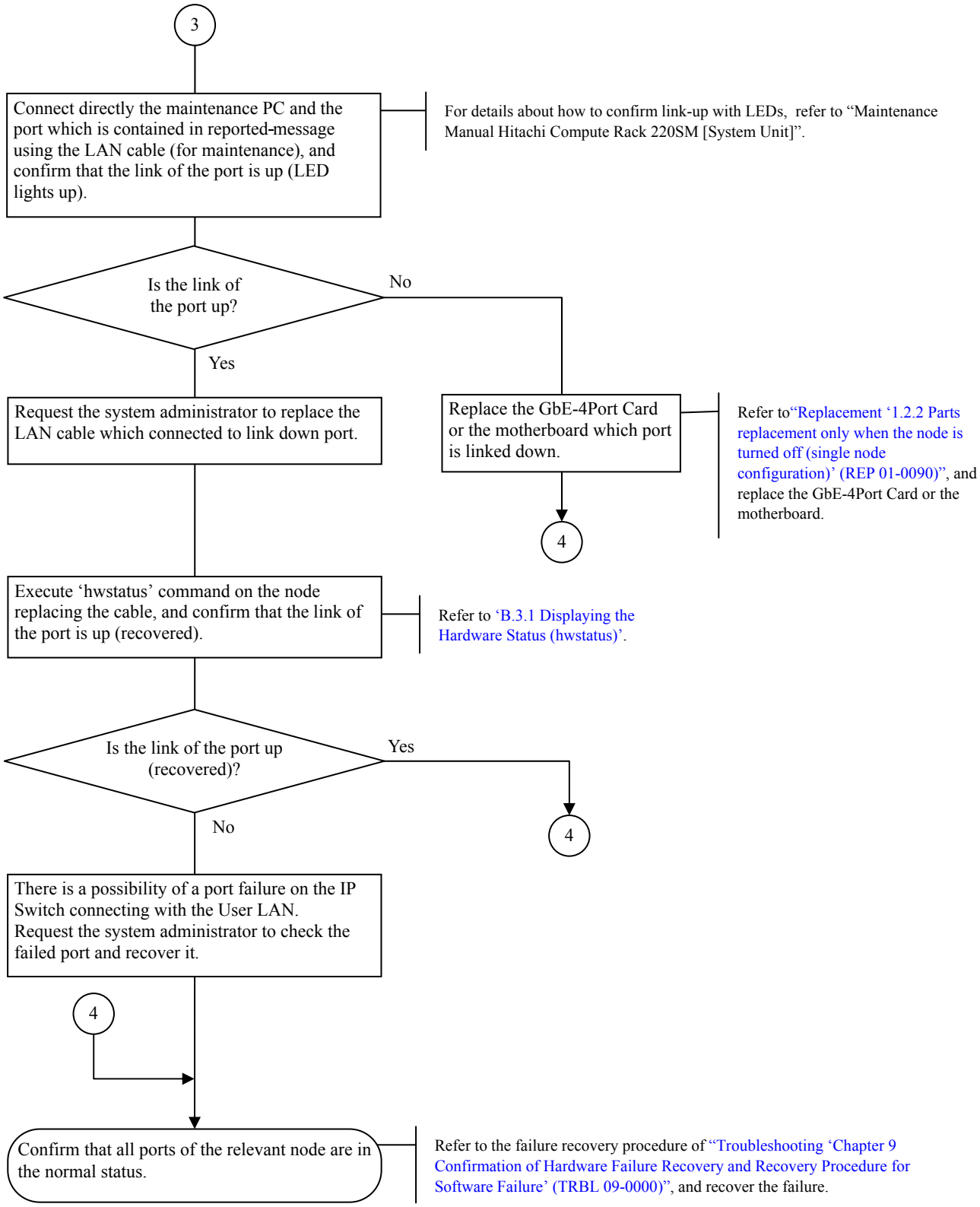

Figure C.2.3.6-3 Determination of network failure (KAQK39504-E) (4/4)

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C.2.4 Diagnosis for OS Boot Failure

This section describes how to diagnose when the replaced part failure or other failure cause the OS boot failure after parts replacement operation.

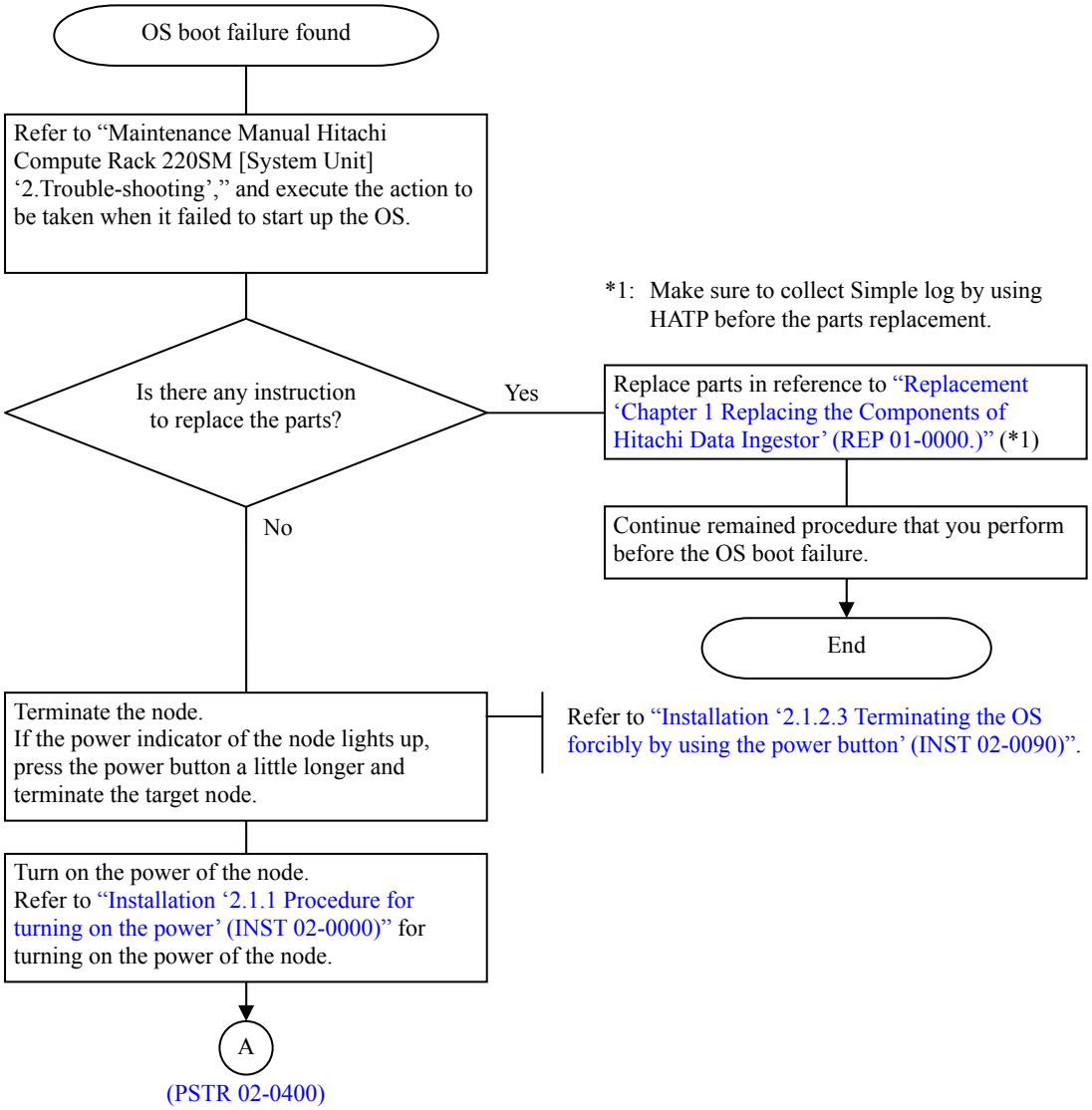

Figure C.2.4-1 Flow of Diagnosis for OS boot failure (1/5)

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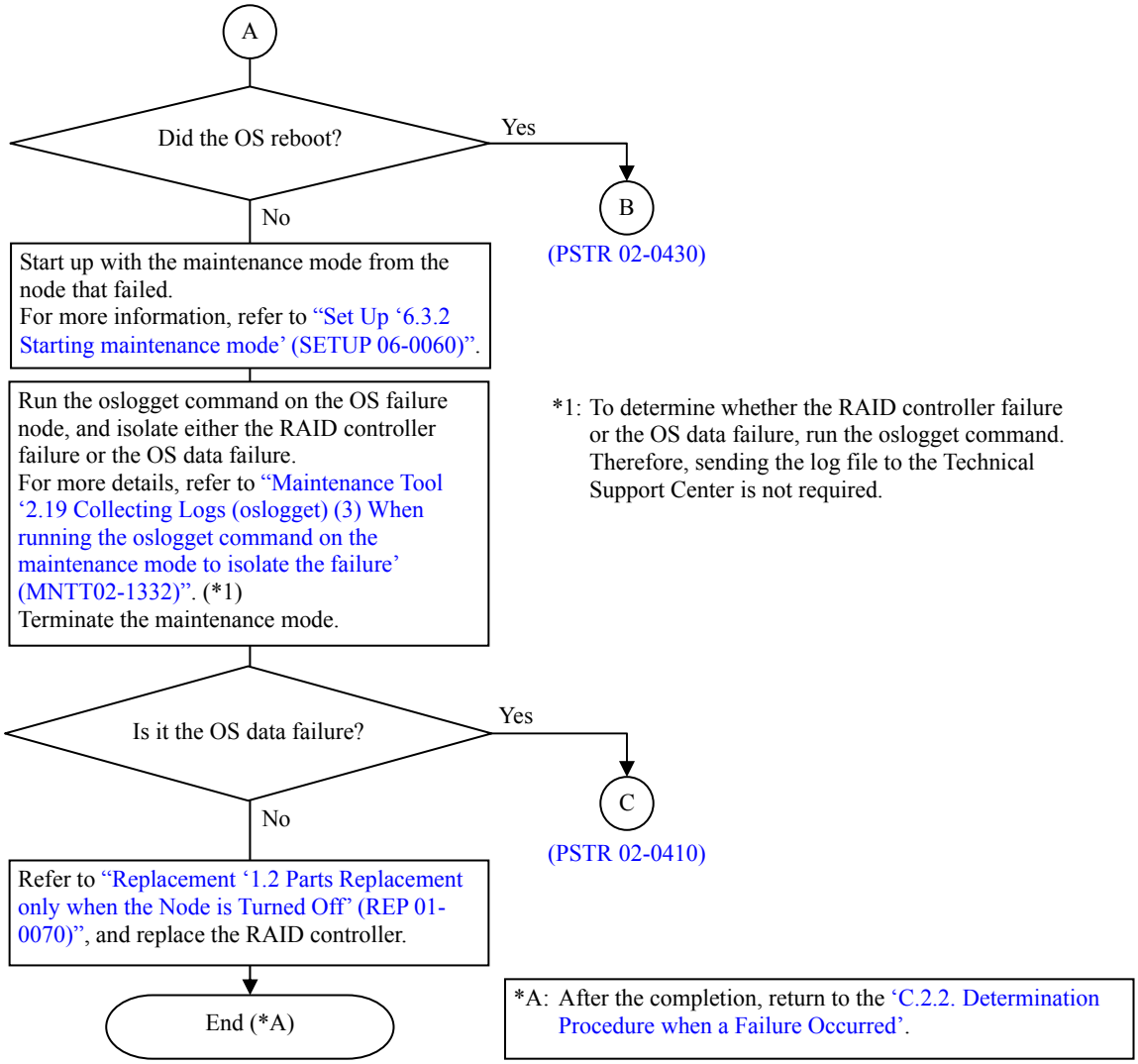

Figure C.2.4-1 Flow of Diagnosis for OS boot failure (2/5)

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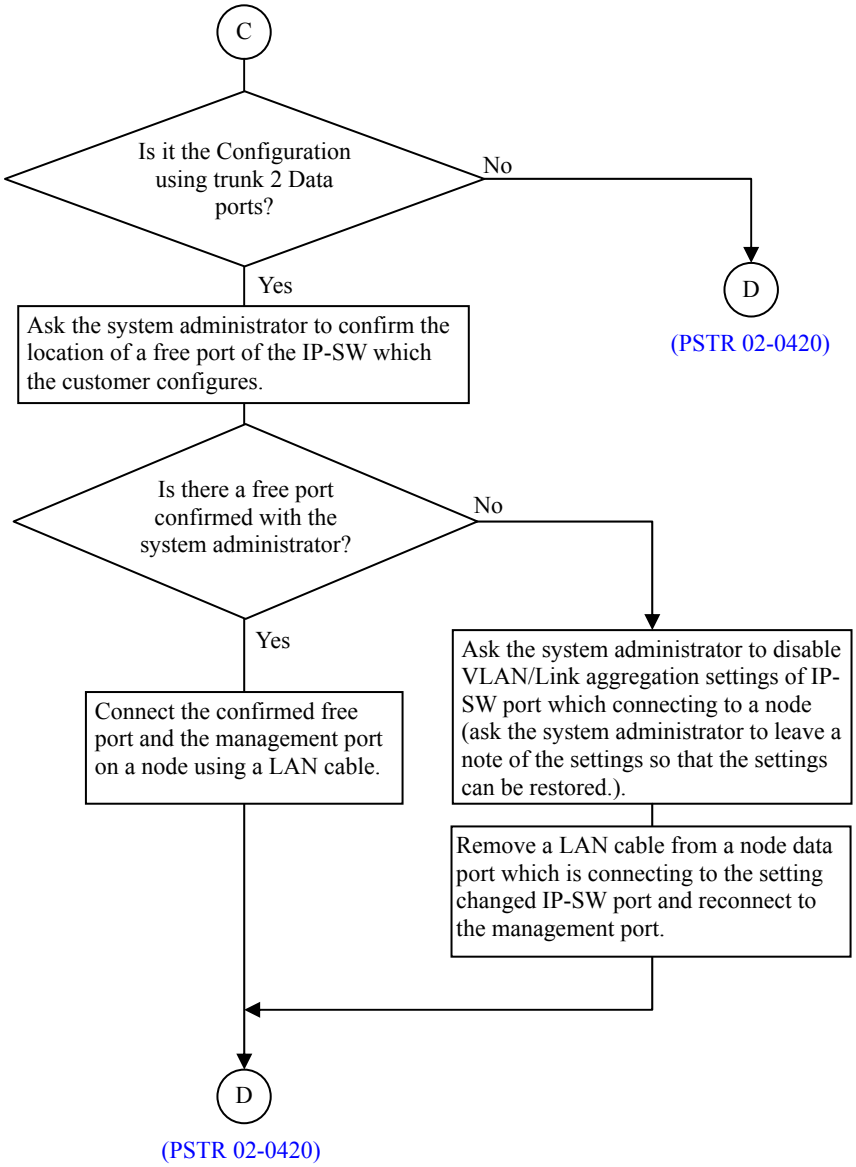

Figure C.2.4-1 Flow of Diagnosis for OS boot failure (3/5)

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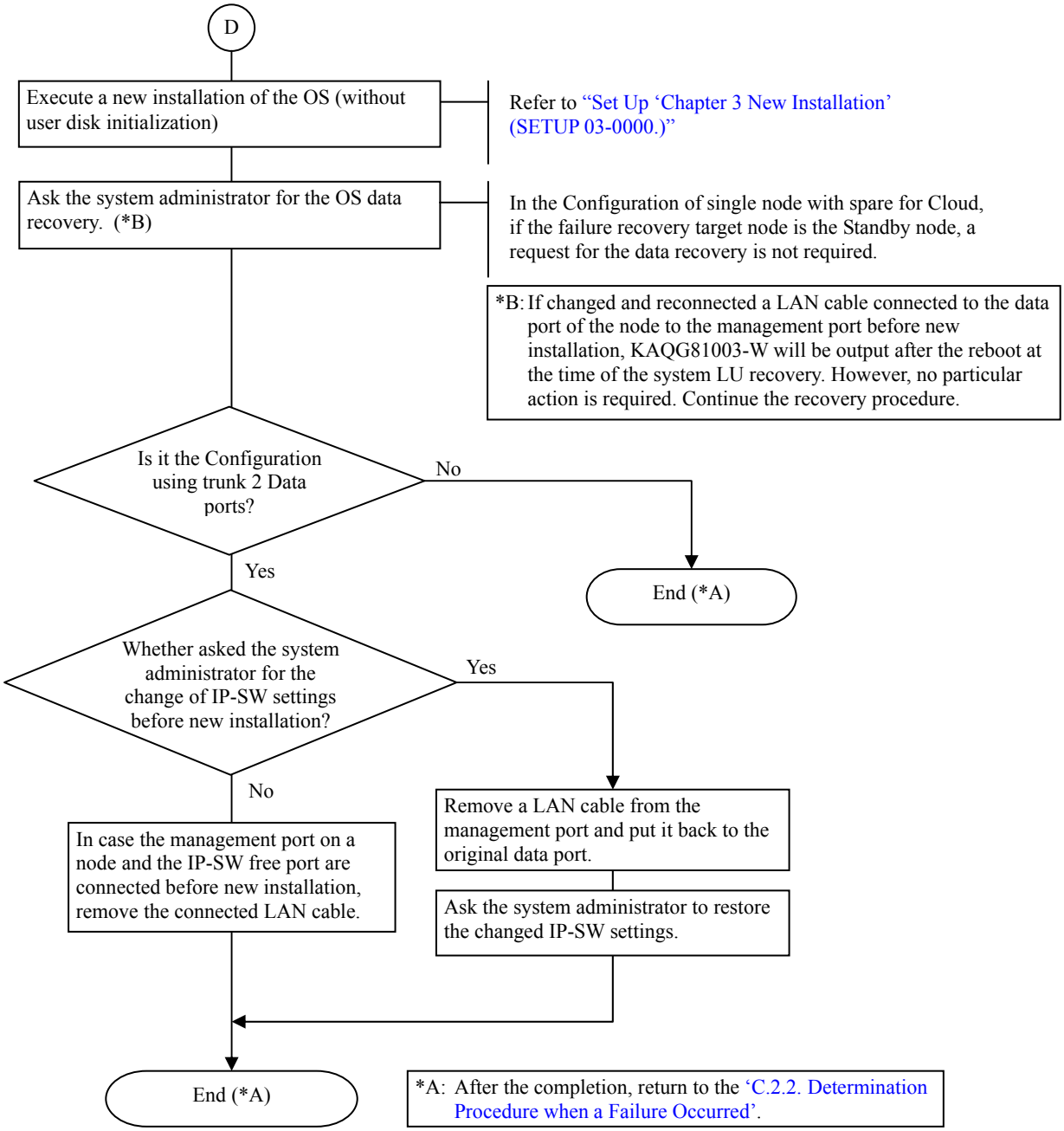

Figure C.2.4-1 Flow of Diagnosis for OS boot failure (4/5)

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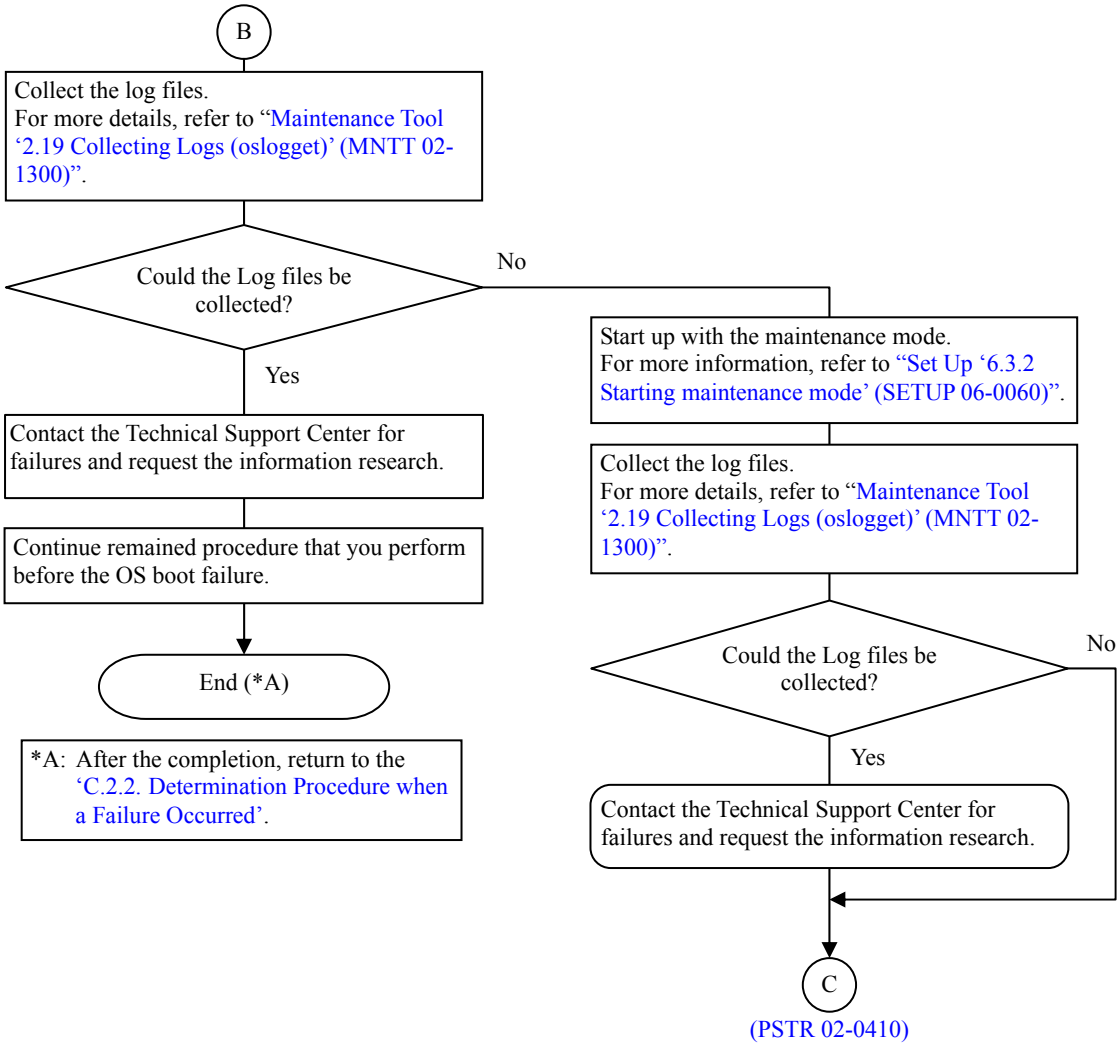

Figure C.2.4-1 Flow of Diagnosis for OS boot failure (5/5)

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C.3 Messages

This chapter describes messages.

C.3.1 SIM Messages

SIM messages detected by HDI and the recovery methods are described below.

Table C.3.1-2 Message IDs (80000s)

Message ID	Message text	Description	Recovery method	Reference Page
KAQG81003-W	Trunking driver: One or more subdevices are down. *<master-device-name>:<subdevice-name>,<subdevice-name>…*	Links of the reported driver are combined (i.e. the number of links increases or decreases).	Follow the determination flowchart of Troubleshooting 'C.2.3.6 Determination of network failure (1) In the case of the KAQG81003-W'.	'C.2.3.6 Determination of network failure (1) In the case of the KAQG81003-W'
KAQG81004-I	Trunking driver: The subdevices that were down have been recovered. *<master-device-name>: <subdevice-name>, <subdevice-name>…*	Links of the reported driver are combined (i.e. down links have recovered).	—	—
KAQG81101-W	Trunking driver: The master device *<link-combined-device-name>* is down because all the sub-device were down.	Failures occurred in all ports of the combined links.	Follow the determination flowchart of Troubleshooting 'C.2.3.6 Determination of network failure (3) In the case of the KAQK39504-E'.	'C.2.3.6 Determination of network failure (3) In the case of the KAQK39504-E'
KAQK81102-I	Trunking driver: The sub-devices that were down have recovered, and the master device *<link-combined-device>* has recovered.	All ports of the combined links have recovered.	—	—

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Table C.3.1-3 Message IDs (30000s)

Message ID	Message text	Description	Recovery method		Reference Page
KAQK30800-I	Migration terminated. (Policy name: <*policy name*>, Task id: <*task-id*> , Task status: <*task-status*>, Lastexec start time: <*lastexec-start-time*>, Lastexec end time: <*lastexec-end-time*>, Succeeded files: <*succeeded-files*>, Target files: <*target-files*>, Failed files: <*failed-files*>, Post-command result: <*post-command-result*>)	The termination of the migration job occurred.	—		—
KAQK30801-E	MIACAT detected a failure(MAR=<*MAR*> RC=<*RC*>)	A hardware failure occurred in the node and RC is detected.	①	Execute ccp command and acquire the RC information.	"Maintenance Tool '2.61 RC Information Acquisition (ccp)' (MNTT 02-3270)"
			②	Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]," and determine the failure part from the RC and the continuous log.	"Maintenance Manual Hitachi Compute Rack 220SM [System Unit]"
			③	Replace the part that determined as failed.	"Replacement 'Chapter 1 Replacing the Components of Hitachi Data Ingestor'(REP 01-0000)"
KAQK36504-W	NIC: Link down detected (<*interface-name*>)	NIC became link-down.	Follow the determination flowchart of Troubleshooting 'C.2.3.6 Determination of network failure (2) In the case of the KAQK36504-W'.		'C.2.3.6 Determination of network failure (2) In the case of the KAQK36504-W'

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK36700-E	An FC path error has occurred. (number of LUs for which errors occurred =<*the number of failed LUs*>)	FC path failure occurred. The number of LUs on which failures are detected is displayed.	Follow the determination flow ‘C.2.2 Determination Procedure when a Failure Occurred’ and identify the failure location on the FC path.	‘C.2.2 Determination Procedure when a Failure Occurred’
KAQK36701-E	Errors have occurred on all the FC paths. (number of LUs for which errors occurred = <*the number of failed LUs, subsequent process*>)	Failures occurred in all paths to the LU. The number of LUs on which failures are detected is displayed. In the case “reboot” is displayed as a subsequent processing, the OS has been restarted after the failure. In the case “continue” or “failure” is displayed as a subsequent processing, the OS has been running (not restarted). In the case of “disconnect,” normally the OS has been restarted after the failure, but depend on the settings, the OS may have been running without restarting.	Check if the KAQK39527-E message was reported before/after this message. • If it is found, refer to “Message IDs (KAQK39527-E.)” • If it is not found, Check that the KAQK36700-E message was reported before this message and perform the procedure of KAQK36700-E.	‘Message IDs (KAQK39527-E)’ Message IDs (KAQK36700-E)

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK36703-E	An attempt to allocate memory failed.	Failed to allocate memory.	Check if the KAQK36705-E message was reported after this message. • If it is confirmed, refer to "Message IDs (KAQK36705-E)". • If it is not confirmed, follow the determination flowchart of 'C.2.2 Determination Procedure when a Failure Occurred' to identify the failure location on the FC path.	Message IDs (KAQK36705-E) 'C.2.2 Determination Procedure when a Failure Occurred'
KAQK36704-E	An attempt to attach the HDLM driver (the filter component) has failed. Number of failed paths = <*number*>	Unsupported disk array is detected.	Request the system administrator to check the zoning setting of FC-SW.	—
KAQK36705-E	The system retried to allocate memory but the retries failed.	Memory allocation was attempted in succession but failed.	A FC path failure has occurred. Follow the determination flow 'C.2.2 Determination Procedure when a Failure Occurred' to identify the failure location on the FC path.	'C.2.2 Determination Procedure when a Failure Occurred'
KAQK37512-E	The number of internal RAID device media errors has exceeded the threshold. (internal_disk_<*number*>)	A media error in the built-in HDD is detected.	Execute hwstatus command and check [Internal HDD Information] to identify the failed HDD. Replace the built-in HDD that is subject to be replaced for the prevention.	'B.3.1 Displaying the Hardware Status (hwstatus)' "Replacement '1.3.2 Replacing the Internal Hard Disk Drive (single node configuration)'(REP 01-0150)"
KAQK37513-I	The number of internal RAID device media errors has been cleared. (internal_disk<*number*>)	A media error in the built-in HDD is recovered.	—	—
KAQK37514-E	The number of internal RAID device S.M.A.R.T. warnings has exceeded the threshold. (internal_disk_<*number*>)	The built-in HDD detects S.M.A.R.T. warning.	Replace the built-in HDD that is subject to be replaced for the prevention.	"Replacement '1.3 Replacing the Internal Hard Disk Drive'(REP 01-0110)"
KAQK37515-I	The number of internal RAID device S.M.A.R.T. warnings has been cleared. (internal_disk_<*number*>)	Recovered the S.M.A.R.T. warning that is detected by the built-in HDD.	—	—

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK37516-I	Patrol Read detected information.(Details: time =<*time*>, code = <*code*>, content = <*content*>, count = <*count*>)	Some events about internal HDD were detected. (Number of count is displayed only when the multiple events occurred.)	—	—
KAQK37518-I	Patrol Read detected an error.(Details: time =<*time*>, code = <*code*>, content = <*content*>, count = <*count*>)	Critical Error might be occur at internal HDD. (Number of count is displayed only when the multiple errors occurred.)	The slot number of failed embedded HDD is displayed as "sX (X is positive integer)" in "content" of the message. Replace the embedded HDD connected to that slot number.	"Replacement '1.3 Replacing the Internal Hard Disk Drive'(REP 01-0110)"
KAQK37523-I	Information regarding the internal RAID battery was detected. (time = <*time*>, code =0x000c, content = <*content*>)	Information regarding the cache backup module was detected.	—	—
KAQK37524-W	An internal RAID battery failure was detected. (time = <*time*>, code = 0x000a, content = <*content*>)	A cache backup module failure was detected.	Turn off the power of the node and replace the RAID controller.	"Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)'(REP 01-0090)"
KAQK37525-E	An internal RAID battery failure was detected. (time = <*time*> code = <*code*>, content = <*content*>)	A cache backup module failure was detected.	Cache data recovery (writing the data to Flash memory, or reading the data at the time of power restoration) was failed. Replace the RAID controller.	"Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)'(REP 01-0090)"
KAQK37526-I	Consistency Check detected information.(time = <*time*>, code = <*code*>, content = <*content*>, count = <*count*>)	Consistency Check detected information. ("count" is displayed only when the detection is more than once.)	—	—
KAQK37528-E	Consistency Check detected an error.(time = <*time*>, code = <*code*>, content = <*content*>, count = <*count*>)	Consistency Check detected an error. ("count" is displayed only when multiple errors occurred.)	Execute hwstatus command and confirm that [ok] is displayed as [Internal HDD Information]. After confirming that, collect the failure information and contact the developer.	'B.3.1 Displaying the Hardware Status (hwstatus)' "Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
KAQK37530-I	The system recovered from an internal RAID battery failure.	The system recovered from a cache backup module failure,	—	—
KAQK37532-E	A failure has been detected in an internal RAID battery.	A failure has been detected in a cache backup module.	Replace the RAID controller.	"Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)'(REP 01-0090)"

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK39500-E	OS error Detail= 00 00 00 01 ,Level =00 , Type=02	The file system necessary for booting is blocked or failed in mounting.	Follow the determination flowchart of ‘C.2.2 Determination Procedure when a Failure Occurred’.	‘C.2.2 Determination Procedure when a Failure Occurred’
	OS error Detail= 00 00 00 02 ,Level =00 , Type=02	A user file system is blocked.	Follow the determination flowchart of ‘C.2.2 Determination Procedure when a Failure Occurred’.	‘C.2.2 Determination Procedure when a Failure Occurred’
	OS error Detail= 00 00 00 03 ,Level =00 , Type=02	The file system of the OS area is blocked.	Follow the determination flowchart of Troubleshooting “9.2.3 Recovery Procedure for Software Failure”.	“Troubleshooting ‘9.2.3 Recovery Procedure for Software Failure’ (TRBL 09-0640)”
	OS error Detail= 00 01 00 02 ,Level =00 , Type=0A	The target file system to be stored is initialized before creating dump file.	Node is rebooted because of occurrence of an error, and an error is detected while collecting Dump. Collect the information of troubles, and report it to the Technical Support Center after executing troubleshooting with referring to the chapter of troubleshooting.	“Troubleshooting ‘Chapter 6 Acquiring Failure Information’ (TRBL 06-0000)”
	OS error Detail= 00 02 00 02 ,Level =00 , Type=0A	Failed to mount the target file system to be stored at the time of dump collecting.	An error detected in the dump area while starting the node. Execute troubleshooting with referring to ‘C.2.2 Determination Procedure when a Failure Occurred’.	‘C.2.2 Determination Procedure when a Failure Occurred’
	OS error Detail= 05 00 00 00 ,Level =00 , Type=03	A panic failure occurred on the node that failed.	① • If it is after nncreset command execution of the “Maintenance Tool ‘2.30 Resetting the OS of the Node (nncreset)’” performed by the maintenance personnel, proceed to step②. • If it is not a result of the command that is executed by the maintenance personnel, proceed to step③.	“Maintenance Tool ‘2.30 Resetting the OS of the Node (nncreset)’ (MNTT 02-1840)”
			② It indicates that the nncreset command successfully complete and the dump can be obtained normally. Proceed to the next step such as the collecting dump.	—
			③ A panic failure occurred on the node that failed, and the dump can be obtained normally after the failure. Refer to ‘C.2.3.4 Determining the node failure when failover occurred,’ and then execute the failure determination.	‘C.2.3.4 Determining the node failure when failover occurred’

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Message ID	Message text	Description	Recovery method		Reference Page
(Continued) KAQK39500-E	OS error Detail= 05 00 00 01 ,Level =00 , Type=03	Memory image copying is complete successfully.	①	• If it is manual dump collection by the system administrator or the maintenance personnel (dump collection by the NMI button or the nncreset command of "Maintenance Tool '2.30 Resetting the OS of the Node (nncreset)'", proceed to step②. • In other cases than the above, proceed to step③.	"Maintenance Tool '2.30 Resetting the OS of the Node (nncreset)' (MNTT 02-1840)"
			②	After a while, if "KAQK39528-I Processing to convert dump files ended." is displayed, as the dump file conversion is successful, execute the subsequent operation such as downloading dump. If the other SIM than the above is displayed after a while, the dump file creation failed. Collect the failure information, and contact the developer.	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)'
			③	A panic failure occurred on the failed node, and then the dump is acquired normally. Refer to 'C.2.3.4 Determining the node failure when failover occurred', and determine the failure.	'C.2.3.4 Determining the node failure when failover occurred'
	OS error Detail= 06 00 00 00 ,Level =00 , Type=03	Dump conversion timeout.	The node is rebooted due to a software failure. Collect the failure information and contact the developer.		"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
	OS error Detail= 06 00 01 00 ,Level =00 , Type=03	Dump file conversion failed.	The node is rebooted due to a software failure. Collect the failure information and contact the developer.		"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
	OS error Detail= 06 00 02 00 ,Level =00 , Type=03	Forced conversion of the dump file failed.	The node is rebooted due to a software failure. Collect the failure information and contact the developer.		"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
	OS error Detail= 06 00 03 00 ,Level =00 , Type=03	Memory image copying failed.	The node is rebooted due to a software failure. Collect the failure information and contact the developer.		"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
	OS error Detail= 06 01 01 00 ,Level =00 , Type=0A	Failed to register the function of dump file creation.	Failed to register the dump file creation function which is executed at the time of boot the node. Collect the failure information and contact the developer.		"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
KAQK39501-E	Fatal failure detected. Shutting down.	An emergency shutdown occurred.	—		—
KAQK39502-I	OS is ready	This message is reported just before completion of the OS boot.	—		—
KAQK39503-I	OS is shutting down.	This message reports that shutdown of either system or both systems have started.	—		—

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK39504-E	Link down in Front-end LAN	The data LAN or the maintenance LAN is link-down.	Follow the determination flowchart of Troubleshooting ‘C.2.3.6 Determination of network failure (3) In the case of the KAQK39504-E’.	‘C.2.3.6 Determination of network failure (3) In the case of the KAQK39504-E’
KAQK39506-I	A failure occurred. Please follow the proper recovery procedure. Detail=10 03 00 00	All file systems were blocked due to D-vol overflow (when the script was started).	Send the content of this message to the system administrator.	—
	A failure occurred. Please follow the proper recovery procedure. Detail=10 04 00 00	All NFSs were blocked due to D-vol overflow (when the script was started).	Send the content of this message to the system administrator.	—
KAQK39526-I	The blockage of the file system (file-system-name) has been released.	The blockage of the file system (file-system name) has been released.	—	—
KAQK39527-E	A file system (file system name = <*file system name*>, device = <*device number*>) is blocked because there is no unused capacity in the Pool	The user file system has been in blockage because of the DP pool exhaustion .	Ask system administrator to recover the DP pool exhaustion.	—
KAQK39528-I	Processing to convert dump files ended.	Dump file conversion ended normally.	—	—
KAQK39539-I	Conversion processing ended successfully for all the dump files.	Converting all the unconverted dump files is complete.	—	—

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK39601-E	Single Node error Detail=00 00 00 10 Level=00 Type=04	Mounting of file system failed.	Ask the system administrator for the enabling or disabling of the local data encryption and the HCP payload encryption. If the local data encryption is enabled, ask the system administrator to confirm one of the system messages KAQM05256-E, KAQM05258-E to KAQM05264-E, KAQM05325-W has not been output. In case the one of the messages has been output, ask the system administrator to take an appropriate action. If no message has been output, or the local data encryption and HCP payload encryption are disabled, refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 11 Level=00 Type=04	Dismounting of file system failed.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 20 Level=00 Type=04	Starting the NFS sharing failed.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 21 Level=00 Type=04	Terminating the NFS sharing failed.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 40 Level=00 Type=04	Startup of the CIFS service failed.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 41 Level=00 Type=04	Stopping of the CIFS service failed.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"

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Message ID	Message text	Description	Recovery method	Reference Page
(Continued) KAQK39601-E	Single Node error Detail=00 00 00 50 Level=00 Type=04	Startup of the File snapshot or the file version restore function failed.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	Single Node error Detail=00 00 00 51 Level=00 Type=04	Stopping of the File snapshot or the file version restore function failed.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	Single Node error Detail=00 00 00 F0 Level=00 Type=04	Startup of the resource on the single node failed.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	Single Node error Detail=00 00 00 F1 Level=00 Type=04	Stopping of the resource on the single node failed.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
KAQK39603-E	An attempt to connect user disk failed. (Detail=00 00 02 01 Level=00 Type=04)	Initialization process of the user disk failed.	Refer to the failure recovery procedure of Troubleshooting “9.2.3.1 Failure recovery when the file system is blocked” and recover the failure.	“Troubleshooting ‘9.2.3.1 Failure recovery when the file system is blocked’ (TRBL 09-0660)”
	An attempt to connect user disk failed. (Detail=00 00 02 02 Level=00 Type=04)	Configuration of the user disk is invalid.	① Execute fpstatus command, and reboot the OS if “Status” of all paths are “Online.” If any “Status” other than “Online” is included, proceed to step②.	“Maintenance Tool ‘2.5 Displaying the FC Status (fpstatus)’ (MNTT 02-0280)” “Maintenance Tool ‘2.29 Rebooting the OS of This Side Node (nasreboot)’ (MNTT 02-1790)”
			② Refer to the failure recovery procedure of Troubleshooting “5.1 Determining FC Path Failures” and recover the failure.	“Troubleshooting ‘5.1 Determining FC Path Failures’ (TRBL 05-0000)”

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C.3.2 LCD Display Message Code

This is unsupported configuration in this mode.

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C.3.3 KAQX Messages

This page describes KAQX messages detected by HDI Single related with HCP Anywhere and the recovery methods.

Table C.3.3-1 Message IDs (KAQXxxxxx)

Message ID	Message text	Recovery method	Reference Page
KAQX10001-E	Internal disk failure (slot ID = <*slot_ID*>, status = <*status*>)	Execute hwstatus command and check [Internal HDD Information] to identify the failed HDD. Replace the HDD that determined as failed.	'B.3.1 Displaying the Hardware Status (hwstatus)' "Replacement '1.3.2 Replacing the Internal Hard Disk Drive (single node configuration)'(REP 01-0150)"
KAQX10013-E	File system blocked (<*filesystem-name*>)	Execute same troubleshooting as "KAQK39601-E(Single Node error Detail=00 00 00 10 Level=00 Type=04)" in 'C.3.1 SIM Messages'.	'C.3.1 SIM Messages Message IDs (KAQK39601-E)'
KAQX10014-E	A problem was detected in a fan. (<fan_*fanID*>)	Execute hwstatus command and check [Fan Information] to identify the failed fan unit. Replace the fan unit that determined as failed.	'B.3.1 Displaying the Hardware Status (hwstatus)' "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)'(REP 01-0090)"
KAQX10016-E	A media error was detected with respect to the internal HDD. (slot number = <*slot_number*>)	Execute same troubleshooting as "KAQK37512-E" in 'C.3.1 SIM Messages'.	'C.3.1 SIM Messages Message IDs (KAQK37512-E)'
KAQX10017-E	The internal HDD detected a S.M.A.R.T. warning. (slot number = <*slot_number*>)	Execute same troubleshooting as "KAQK37514-E" in 'C.3.1 SIM Messages'.	'C.3.1 SIM Messages Message IDs (KAQK37514-E)'
KAQX10018-E	An attempt to start the NFS service failed.	Execute same troubleshooting as "KAQK39601-E(Single Node error Detail=00 00 00 20 Level=00 Type=04)" in 'C.3.1 SIM Messages'.	'C.3.1 SIM Messages Message IDs (KAQK39601-E)'
KAQX10019-E	An attempt to start the CIFS service failed.	Execute same troubleshooting as "KAQK39601-E(Single Node error Detail=00 00 00 40 Level=00 Type=04)" in 'C.3.1 SIM Messages'.	'C.3.1 SIM Messages Message IDs (KAQK39601-E)'
KAQX10021-E	An attempt to start the file version restore function failed.	Execute same troubleshooting as "KAQK39601-E(Single Node error Detail=00 00 00 50 Level=00 Type=04)" in 'C.3.1 SIM Messages'.	'C.3.1 SIM Messages Message IDs ((Continued) KAQK39601-E)'
KAQX10022-E	An attempt to start the resource group failed.	Execute same troubleshooting as "KAQK39601-E(Single Node error Detail=00 00 00 F0 Level=00 Type=04)" in 'C.3.1 SIM Messages'.	'C.3.1 SIM Messages Message IDs ((Continued) KAQK39601-E)'
KAQX10023-E	An inconsistency was detected in the user disk configuration. (slot number = <*slot_number*>)	Execute same troubleshooting as "KAQK39603-E(An attempt to connect user disk failed. (Detail=00 00 02 02 Level=00 Type=04)" in 'C.3.1 SIM Messages'.	'C.3.1 SIM Messages Message IDs (KAQK39603-E)'

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D.1 Replacing the Components

Table D.1-1 shows the parts to be replaced and the status of the OS operation to the node in replacement. The parts name of the hardware vendor is also shown in the following table because it must see "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" depends on the parts to be replaced.

Table 1-1 Parts to be Replaced and the Status of the OS Operation to the Node in Replacement (1/2)

No.	Component	Maintenance Manual Hitachi Compute Rack 220SM [System Unit] component name	Node configuration	Node OS operation status		Parts replacement	Approximate work time
				On (*1)	Off		
1	Power Supply unit	power supply	Single node configuration	Y (*2)	Y	'D.1.1.2 Replacing the Power Supply Unit/ AC Cable (single node configuration)'	30 minutes
2	Fan unit	FAN and FAN Board	Single node configuration	N	Y	'D.1.2.2 Replacing the Fan Unit (single node configuration)'	30 minutes
3	Internal hard disk drive	HDD	Single node configuration	Y (*3)	Y	'D.1.3.2 Replacing the Internal Hard Disk Drive (single node configuration)'	90 minutes
4	RAID Controller	RAID card	Single node configuration	N	Y	'D.1.4.2 Replacing the RAID Controller (single node configuration)'	30 minutes
5	Memory	Memory board	Single node configuration	N	Y	'D.1.5.2 Replacing the Memory (single node configuration)'	30 minutes
6	GbE-4Port Card 10GbE-2Port card	PCI Cards	Single node configuration	N	Y	'D.1.7.2 Replacing the GbE-4Port Card (single node configuration)'	30 minutes
7	Fibre Channel Card	PCI Cards	Single node configuration	N	Y	D.1.6.2 Replacing Fibre Channel Card (single node configuration)'	60 minutes
8	Motherboard	mother board	Single node configuration	N	Y	'D.1.9.2 Replacing the Motherboard (single node configuration)'	50 minutes
9	DVD Drive	—	Single node configuration	Y	Y	'D.1.10 Replacing the DVD Drive'	1 minute
10	CPU	CPU	Single node configuration	N	Y	'D.1.11.2 Replacing the CPU (single node configuration)'	30 minutes

*1: The node is in operation.
*2: Only in the case of one failed Power Supply unit, it can be replaced while the power is turned on (in the case of two failed Power Supply units, they need to be replaced while the power is turned off).
*3: In the case of one failed HDD per 1RAID group, it can be replaced while the power is turned on (in the case of two failed HDDs per 1RAID group, they need to be replaced while the power is turned off. However, in the case of RAID6, even if the two HDDs failed, they can be replaced while the power is turned on).

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Table 1-1 Parts to be Replaced and the Status of the OS Operation to the Node in Replacement (2/2)

No.	Component	Maintenance Manual Hitachi Compute Rack 220SM [System Unit] component name	Node configuration	Node OS operation status		Parts replacement	Approximate work time
				On (*1)	Off		
11	HDD Backplane board	HDD backplane and Rear HDD cage Kit	Single node configuration	N	Y	'D.1.12.2 Replacing the HDD Backplane board (single node configuration)'	60 minutes
12	Front Panel Board	front panel board	Single node configuration	N	Y	'D.1.13.2 Replacing the Front Panel Board (single node configuration)'	30 minutes
13	Lithium Battery	Lithium Battery	Single node configuration	N	Y	'D.1.15.2 Replacing the Lithium Battery (single node configuration)'	30 minutes
14	PCI Riser Board	PCI riser board	Single node configuration	N	Y	'D.1.16.2 Replacing the PCI Riser Board (single node configuration)'	30 minutes
15	CPU Heatsink	CPU Heatsink	Single node configuration	N	Y	'D.1.17.2 Replacing the CPU Heatsink (single node configuration)'	30 minutes
16	Cable	One of the followings : •SAS Cable •FAN Signal Cable •FAN Power Cable •SGPIO Cable •HDD Power Cable	Single node configuration	N	Y	'D.1.19.2 Replacing the Cable (single node configuration)'	30 minutes
17	USB Board	USB Board	Single node configuration	N	Y	'D.1.23.2 Replacing the USB board (single node configuration)'	30 minutes
18	SFP module	—	Single node configuration	N	Y	'D.1.24.2 Replacing the SFP module (single node configuration)'	10 minutes

*1: The node is in operation.

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D.1.1 Replacing the Power Supply Unit/ AC Cable

D.1.1.1 Replacing the Power Supply Unit/ AC Cable (cluster configuration)

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D.1.1.2 Replacing the Power Supply Unit/ AC Cable (single node configuration)

Select either method:

Table D.1.1.2-1 Replacing a power supply unit

Method	Node status at replacement	Replacement procedure
1	The node is running.	(1) Replacement procedure while the node is in operation
2	The node is turned off.	(2) Replacement procedure while the node is turned off

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(1) Replacement procedure while the node is in operation

NOTE: When replacing AC cable, read the word of Power supply unit as AC cable.

(a) Check the hardware status. Check that “failed” is displayed for either 0 or 1 in “Power Supply Information” on the screen.
(For details about how to check the hardware status, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus.)’)

(b) Refer to “Maintenance Manual Hitachi Compute Rack 220SM [System Unit]” and replace the power supply unit.

NOTE: Precautions for parts replacement
- When replacing power supply unit, replace it with the instruction described in “Maintenance Manual Hitachi Compute Rack 220SM [System Unit]”.
- Simple log acquisition instructed in “Maintenance Manual Hitachi Compute Rack 220SM [System Unit]” is unnecessary.

(c) After replacing the power supply unit, connect the power supply cable to check if the power source lamp is on in green. For the power supply lamp confirmation of the power supply unit, refer to “Maintenance Manual Hitachi Compute Rack 220SM [System Unit]”.

(d) Check the hardware status. Check whether “ok” is displayed for both 0 and 1 of “Power Supply Information” on the screen.
(For details about how to check the hardware status, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus)’.)

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(2) Replacement procedure while the node is turned off

(a) Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and replace the power supply unit.

NOTE: Precautions for parts replacement

- When replacing power supply unit, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]", and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, other possible suspect parts might be replaced. In this case, return to 'C.2.2.2 Failure determination procedure at the single node configuration' and determine the subject parts.

(b) When the replacement of the power supply unit is done by removing all the cables, reconnect the cables to the location as it were, and check that the SERVICE lamp on the front side of the node is blinking. For the power supply lamp of the power supply unit, refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]".

(c) Turn on the Power switch, and check that the Power lamp is turned on in green light. In the case of the light color is other than green, take measures in accordance with the description in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]", and then check the Power lamp again. This procedure is unnecessary when the node is started by connecting cables at (b).

(d) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (e).
If the login prompt window is displayed, proceed to the step (e).

NOTE: Wait approximately 10 minutes until the OS is completely started.

(e) Check if the resource group is running normally.
Execute rgstatus command to confirm whether the resource group is running normally.
For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

(f) Check the hardware status. Check whether "ok" is displayed for both 0 and 1 of "Power Supply Information" on the screen.
For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.

(g) Return to the step (d) of "Replacement '1.1.2 Replacing the Power Supply Unit/ AC cable (single node configuration) (2) Replacement procedure while the node is turned off' (REP 01-0060)" and execute the rest of the procedures.

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D.1.2 Replacing the Fan Unit

Replacement procedures of the fan unit and the fan board are as follows.

D.1.2.1 Replacing the Fan Unit (cluster configuration)

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D.1.2.2 Replacing the Fan Unit (single node configuration)

(1) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and execute fan unit replacement.

NOTE: Precautions for parts replacement

- When replacing fan unit, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.2 Failure determination procedure at the single node configuration' and determine the subject parts.

(3) After the fan unit replacement is complete, in case the replacement operation was performed by removing all the cables, reconnect the cables where they were, and then turn on the power switch.

(4) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (5).
If the login prompt window is displayed, proceed to the step (5).

NOTE: Wait approximately 10 minutes until the OS is completely started.

(5) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally. For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

(6) After the OS is started on the node, check the following.
Check the hardware status. Check whether "ok" is displayed for all items of "FAN Information" on the screen. (For checking the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.

(7) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.3 Replacing the Internal Hard Disk Drive

Identify the failure part by use of the extension storage bay which is shown in 'Figure A.2.1.1-1 Location of Power Switch, FUNCTION Switch, and SERVICE Switch' and 'A.2.2 Back side.'

D.1.3.1 Replacing the Internal Hard Disk Drive (cluster configuration)

CR220SM does not support the cluster configuration.

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D.1.3.2 Replacing the Internal Hard Disk Drive (single node configuration)

NOTE: If the RAID level check of the internal HDD has not been finished yet, check it in advance.
In case the node is in operation, refer to Internal HDD Information in 'B.3.1 Displaying the Hardware Status (hwstatus)' and check the number of failed HDDs and the location of expansion storage bay.
If there are 2 failed HDDs, specify --list" option for the vgrlist command and execute to confirm the displayed LU status (Refer to "Maintenance Tool '2.91 List of Volume Groups (vgrlist)' (MNTT 02-4460)".
If all displayed LU status is normal, refer to Table D.1.3.2-1. When displayed LU status has error, contact the Technical Support Center.

Execute the procedure by selecting one of the following methods:

Table D.1.3.2-1 Replacing a power supply unit

Method	Node status at replacement	Replacement procedure
1	The node is in operation. (in the case HDD to be replaced (*1) is any of the followings) ・1 HDD on the front side of the node ・1 HDD on the back side of the node ・1 HDD on the front side and 1 HDD on the back side of the node ・2 HDDs on the front side of the node (In case the all vgrlist command results, "LU status" are "normal".)	(1) Replacement procedure while the node is in operation
2	The node is turned off. (in the case HDD to be replaced (*1) is any of the followings) ・2 HDDs on the back side of the node	(2) Replacement procedure while the node is turned off

*1: For details of the location of HDD(s) to be replaced, refer to 'A.2.1 Front side' and 'A.2.2 Back side.'
"HDD on the front side of the node" in the table above indicates Extension storage bay from 1 to 12, and "HDD on the back side of the node" indicates Extension storage bay 13 and 14.

(1) Replacement procedure while the node is in operation

NOTE: You can confirm the logs/status in the replacement while the node is in operation in the following procedures by executing the command of MegaRAID Storage Manager (CLI version.) Therefore, you do not need to install MegaRAID Storage Manager (GUI version) or perform the operations in MegaRAID Storage Manager (GUI version), as described in the manual Maintenance Manual Hitachi Compute Rack 220SM [System Unit].
Remove the internal HDD to be replaced, and replace it with its maintenance part HDD.

(a) Check whether one of following SIM message is displayed. (Refer to "Maintenance Tool '2.6 Displaying SIMs on This Side (syseventlist)' (MNTT 02-0360)".)

- In the case of internal HDD failure, "KAQK30801-E MIACAT detected a failure (MAR=(MAR) RC=(RC))" is displayed. Therefore, confirm that if the RC is a failure code of the internal HDD with reference to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]".

- In the case of internal HDD failure, check the status of the hardware, and confirm the "InternalHDD Information" on the window shows "failed" in either. (for the confirmation of the hardware, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.

- In the case of internal HDD preventing replacement, check if "KAQK37512-E The number of internal RAID device media errors has exceeded the threshold. (internal_disk_number)" or "KAQK37514-E The number of internal RAID device S.M.A.R.T. warnings has exceeded the threshold. (internal_disk_number)" is displayed on the window.
The extension storage bay number for the HDD of the subject to be replaced becomes the value of internal_disk_number as shown in the above message +1.
For the location of the extension storage bay, refer to 'A.2.1 Front side' and 'A.2.2 Back side.'

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(b) Refer to "Maintenance Tool '2.56 Status Information Acquisition of the Virtual Disk and the Physical Disk (state.sh)' (MNTT 02-3110)," and collect the status information of the current internal HDD.

(c) Refer to "Maintenance Tool '2.55 Embedded RAID Controller Internal Log Acquisition (log.sh)' (MNTT 02-3080)", and confirm the obtained log.

(d) Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and execute internal hard disk drive replacement. If a failure occurs in 2 HDDs, replace 2 HDDs.

NOTE: Precautions for parts replacement
When replacing internal HDD, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]".

(e) Refer to "Maintenance Tool '2.58 Confirmation of Rebuilding Progress of Physical Disk (rbldchk.sh)' (MNTT 02-3170)", and confirm the rebuilding progress.

NOTE: Depending on the configuration of the disk drive, it may take several hours to complete rebuild. If maintenance personnel cannot wait for the completion for certain reasons of the customer, click the [Esc] key to stop the command and ask the customer to confirm the completion of rebuild.
In that case, the customer can confirm completion of rebuild from hardware status of the internal HDD on maintenance GUI. In the case rebuild is in progress, "Rebuild" is displayed, and in the case rebuild is completed, "Normal" is displayed.
If the customer performs the confirmation, be sure to ask them not to turn off the power until rebuild is completed.

(f) After replacing the internal HDD, confirm the following items.

- Confirm that the LED of internal HDD turns on in green light or turned off. For the confirmation of the LED of internal HDD, refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]".

- In the case of internal HDD preventing replacement, check if "KAQK37513-I The number of internal RAID device media errors has been cleared. (internal_disk_number) " or "KAQK37515-I The number of internal RAID device S.M.A.R.T. warnings has been cleared. (internal_disk_number) " is displayed on the window. (For the confirmation of the message, refer to "Maintenance Tool '2.6 Displaying SIMs on This Side (syseventlist)' (MNTT 02-0360)".

- Check the hardware status. Check whether "ok" is displayed for "InternalHDD Information" on the screen.
For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.

The confirmation of the above items are all OK, the replacement procedure is complete.

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(2) Replacement procedure while the node is turned off

(a) Replace the internal hard disk drive with referring to “Maintenance Manual Hitachi Compute Rack 220SM [System Unit].”

NOTE: Precautions for parts replacement

- Make sure to collect Simple log by using HATP before the replacement. For the details, refer to “Maintenance Manual Hitachi Compute Rack 220SM [System Unit].”
- When replacing internal HDD, replace it with the instruction described in “Maintenance Manual Hitachi Compute Rack 220SM [System Unit]”, and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, other possible suspect parts might be replaced. In this case, return to ‘C.2.2.2 Failure determination procedure at the single node configuration’ and determine the subject parts.

(b) The procedure differs depending on the configuration.
In case of the configuration using management port, refer to the procedure in Table D.1.3.2-2.
In case of the configuration using trunk 2 Data ports, ask the system administrator for the location of a free port of the IP-SW which the customer configures. Then, refer to the following tables depending on the case.

- If IP-SW has a free port, refer to Table D.1.3.2-3
- If IP-SW does not have a free port, refer to Table D.1.3.2-4

After completing the all referenced recovery procedure, proceed to the procedure (c).

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Table D.1.3.2-2 Failure recovery procedures in the configuration using management port

#	Process	Performed by	Reference
1	Execute a new OS installation (*1)	Maintenance personnel	"Set up 'Chapter 3 New Installation' (SETUP 03-0000)"
2	Set after completing the installation	Maintenance personnel	"Set up '5.1 Setting/Confirmation after New Installation' (SETUP 05-0000)"
3	Execute the OS data recovery	System administrator	—
4	Confirm that no error message related to the file system or the file sharing is output	System administrator	—
5	In the configuration of HDI for Cloud, confirm if the file configuration is consistent between the HDI and the HCP after performing the restoration by executing the CLI command open to the system administrator.	System administrator	—
6	Request I/O confirmation for the system	System administrator	—

*1: When meeting the following conditions, KAQM35001-E, KAQM35003-E, and KAQM35007-E messages are output after the initial installation and before the restoration of the system LU, but continue the recovery procedures; you do not need to take measures for the messages.

- The OS version to be initially installed is 4.0.0-XX or later
- Selected user data initialization on the initial installation

Table D.1.3.2-3 Failure recovery procedures in the Configuration using trunk 2 Data ports (Free Port is Available in IP-SW)

#	Process	Performed by	Reference
1	Confirm with the system administrator the free port of the IP-SW which the customer configures, and connect the confirmed port and the management port of the node by the LAN cable. Connect the free port confirmed with the system administrator and the management port of the node by the LAN cable.	Maintenance personnel	—
2	Execute a new OS installation (*1)	Maintenance personnel	"Set up 'Chapter 3 New Installation' (SETUP 03-0000)"
3	Set after completing the installation (Set the IP address and the Routing that are used at the front-end LAN for the management port IP address. The IP address and the Routing that are used at the front-end LAN should be confirmed with the system administrator.)	Maintenance personnel	"Set up '5.1 Setting/Confirmation after New Installation' (SETUP 05-0000)"
4	Execute the OS data recovery.	System administrator	—
5	After completing the recovery, remove the LAN cable connected to the management port.	Maintenance personnel	—
6	Confirm that no error message related to the file system or the file sharing is output	System administrator	—
7	In the configuration of HDI for Cloud, confirm if the file configuration is consistent between the HDI and the HCP after performing the restoration by executing the CLI command open to the system administrator.	System administrator	—
8	Request I/O confirmation for the system	System administrator	—

*1: When meeting the following conditions, KAQM35001-E, KAQM35003-E, and KAQM35007-E messages are output after the initial installation and before the restoration of the system LU, but continue the recovery procedures; you do not need to take measures for the messages.

- The OS version to be initially installed is 4.0.0-XX or later
- Selected user data initialization on the initial installation

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Table D.1.3.2-4 Failure recovery procedures (Free Port is Not Available in IP-SW)

#	Process	Performed by	Reference
1	Disable VLAN/Link aggregation settings of IP-SW port which connecting to a node (ask the system administrator to leave a note of the settings so that the settings can be restored.).	System administrator	—
2	Remove a LAN cable from a node data port which is connecting to the IP-SW port which disabled at the above step #1 and reconnect to the management port (*2).	Maintenance personnel	—
3	Execute the initial OS installation (*1)	Maintenance personnel	"Set up 'Chapter 3 New Installation' (SETUP 03-0000)"
4	Set after completing the installation.	Maintenance personnel	"Set up '5.1 Setting/Confirmation after New Installation' (SETUP 05-0000)"
5	Execute the OS data recovery (*2).	System administrator	—
6	After the completion of failure recovery, put the LAN cable which was reconnected at the above step #2 back to the original data port.	Maintenance personnel	—
7	Restore the IP-SW settings (VLAN/Link aggregation) changed at the above step #1 .	System administrator	—
8	Confirm that no error message related to the file system or the file sharing is output	System administrator	—
9	In the configuration of HDI for Cloud, confirm if the file configuration is consistent between the HDI and the HCP after performing the restoration by using the CLI command open to the system administrator.	System administrator	—
10	Request I/O confirmation for the system	System administrator	—

*1: When meeting the following conditions, KAQM35001-E, KAQM35003-E, and KAQM35007-E messages are output after the initial installation and before the restoration of the system LU, but continue the recovery procedures; you do not need to take measures for the messages.
- The OS version to be initially installed is 4.0.0-XX or later
- Selected user data initialization on the initial installation

*2: KAQG81003-W is output after rebooting at the time of the system LU recovery. However no particular action is required. Continue the recovery procedure.

(c) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally. For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

(d) After replacing the internal HDD, confirm the following items.

- Confirm that the LED of internal HDD turns on in green light or turned off. For the confirmation of the LED of internal HDD, refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]".

- Check the hardware status. Check whether "ok" is displayed for "InternalHDD Information" on the screen.
  For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.

If the confirmation of the above items are all OK, the replacement procedure is complete.

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D.1.4 Replacing the RAID Controller

D.1.4.1 Replacing the RAID Controller (cluster configuration)

CR220SM does not support the cluster configuration.

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D.1.4.2 Replacing the RAID Controller (single node configuration)

(1) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".
If it is not possible to stop the OS by executing nasshutdown command, press the power switch a little longer.

(2) Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and replace the RAID controller.

NOTE: Precautions for parts replacement

- When replacing RAID controller, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.2 Failure determination procedure at the single node configuration' and determine the subject parts.
- Make sure to collect Simple log by using HATP before the replacement. For the details, refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]."
- Write mode before replacement is taken over to the write mode after replacement. Write through will be set in VD0 (OS LU) and VD1 (CM LU), Write back will be set in VDx ("x" is a value more than 1) (User LU).

(3) After replacing the RAID controller, reconnect the cables where they were if they are all removed at the replacing operation.

(4) If it is the preventive replacement, this step is not required. Skip (4) and go to (5). If the replacement is due to the failure, execute the following procedure.

Confirm Simple log collected by HATP.

(a) Extract the Simple log (log.tgz) collected before the replacement of RAID controller in the maintenance PC to see "MRCTL.txt."

(b) Check whether the description below is output in "MRCTL.txt."

①	"10=Controller cache discarded due to memory/battery problems"
②	"Code: 0x0000000a"

Figure D.1.4.2-1 Error Information

When all the description above ① and ② is output in the text, execute the virtual drive consistency check (*1). For how to execute, refer to 'B.2.8 Virtual Drive Consistency Checking Procedure.'
If not, proceed to step (5).

*1: It may take a long time to check depending on the size of the user LU.

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(5) Turn on the power lamp to confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (6.)
If the login prompt window is displayed, proceed to the step (6.)

NOTE: Wait approximately 10 minutes until the OS is completely started.

(6) If it is the preventive replacement, this step is not required. Skip (6) and go to (7). If the replacement is due to the failure, execute the following procedure.

Check the output SIM.
Execute syseventlist command to check whether either of SIMs in Table D.1.4.2-1 is output. For details, refer to "Maintenance Tool '2.6 Displaying SIMs on This Side (syseventlist)' (MNTT 02-0360.)"
When either of SIMs is output, write down the SIM ID and the Detail Code.
When neither of SIMs is output, request the system administrator to delete and re-create the file system and restore the user data.

Table D.1.4.2-1 SIM List to Check Output

#	SIM message ID	Detail Code	Description
1	KAQK39500-E	00 00 00 02	A user file system is blocked.
2	KAQK37524-W	All the code	A cache backup module failure was detected.

(7) Confirm that the resource group is operated normally.
Execute rgstatus command to confirm that the resource group is operating normally. Refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)" for the method of the confirmation.

(8) Check the firmware version of the RAID controller.
Refer to "Maintenance Tool '2.46 Confirming the Built-in RAID Controller Firmware Version (internalraidfwget)' (MNTT 02-2610)" to check the firmware version of the RAID controller, and record the firmware version.

(9) When a consistency check is scheduled, inform the system administrator that the replaced RAID controller needs to have rescheduling. Also, inform the scheduling should be executed after the maintenance operation.

(10) Return to step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.5 Replacing the Memory

D.1.5.1 Replacing the Memory (cluster configuration)

CR220SM does not support the cluster configuration.

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D.1.5.2 Replacing the Memory (single node configuration)

(1) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and replace the memory.

NOTE: Precautions for parts replacement

- When replacing memory, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.2 Failure determination procedure at the single node configuration' and determine the subject parts.
- Make sure to collect Simple log by using HATP before the replacement. For the details, refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]."

(3) After replacing the memory, reconnect the cables where they were if they are all removed at the replacing operation, and press the power switch on the node.

(4) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (5). If the login prompt window is displayed, proceed to step (5).

NOTE: Wait approximately 10 minutes until the OS is completely started.

(5) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally. For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

(6) After the OS is started on the node, check the hardware status. Confirm whether "installed" is displayed for the status of where the memory replacement was executed in "Memory Information" on the screen. (For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.)

(7) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of procedures.

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D.1.6 Replacing the Fibre Channel Card

D.1.6.1 Replacing the Fibre Channel Card (cluster configuration)

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D.1.6.2 Replacing the Fibre Channel Card (single node configuration)

(1) Stop the OS on the target node.
Before stopping the OS, ask the system administrator if the service can be stopped or not. After confirming that, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740.)"
When replacing FC card due to occurrence of the both paths failures of the target node, execute nasshutdown command with specifying "—force" option.
When the host group security mode is enabled, execute the operation from step (2.)
When the host group security mode is disabled, execute the operation from step (3.)

(2) Record the WWNs that is available for both FC ports of the ordered maintenance part because you need to change the WWNs after replacing the Fibre Channel card.

NOTE:
- A WWN for "PORT 0" (a 16-digit hexadecimal number: 5000xxxx xxxxxxxx) is labeled on the side of the Fibre Channel cable inlet.
- WWN for "PORT 1" can be calculated by adding 2 to the labeled WWN for "PORT 0" described above.
  (e.g., when WWN for "PORT 0" is "5000xxxx xxxx0A29," WWN for "PORT 1" is "5000xxxx xxxx0A2B.")
- A port with smaller port name is "PORT 0."
  (e.g., when the port names are fc0002 and fc0003, fc0002 is "PORT 0.")

(3) Disconnect all the Fibre Channel cables connected to the Fibre Channel card.

(4) Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and replace the Fibre Channel card.
After the replacement, the power source must be stopped because connecting the disconnected Fibre Channel cables and setting the host group security are required.

NOTE: Precautions for parts replacement
- Follow the instruction described in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" to replace the Fibre Channel Card and to confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series.)
- Some results of HATP lead to additional possible suspect part replacement. In this case, return to 'C.2.2.2 Failure determination procedure at the single node configuration' and determine the part to be replaced.
- Make sure to collect Simple log by using HATP before replacement. For details, refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]"

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(5) When the setting of host group security mode is enabled, write down the WWNs of the parts that are removed at step (4.)
When the host group security mode is disabled, execute the operation from step (7.)

(6) To change the WWNs registered to the connection ports on the disk array subsystem, refer to "LUN Manager User's Guide" for the AMS2000 series or HUS100 series, and if USP V, USP VM, VSP, VSP G1000, or HUS VM is connected, refer to "5.3.1.4. LUN Management" in the installation section of the maintenance manual of each system, and if VSP Gx00/VSP Fx00 is connected, refer to "System Administrator Guide" for VSP Gx00/VSP Fx00. To change the WWNs, delete the WWNs recorded in step (5) and then register the WWNs recorded in step (2).
Note that changing registered WWNs is required for each connection destination port.

(7) After replacing the Fibre Channel card and changing the WWNs, connect a Fibre Channel cable to the new Fibre Channel card and press the power button on the node. If cables were all removed before the replacement, reconnect them where they were and press the power button on the node.

(8) After the OS is started, log in the node from the maintenance PC. It normally takes approximately 10 minutes until the OS is completely started.

NOTE: You can log in the node from the maintenance PC even if communication with the array was not restored after the Fibre Channel card replacement. However, in that case, do not execute the commands that affect resource group operation such as rgstatus command, etc.

(9) After the OS is started, check the following.
- Check the LED statuses on the new Fibre Channel card. Make sure at least one port is linked up. Refer to "Maintenance Manual Hitachi Compute Rack [I/O Adapter]" for how to check the LED indication.

(10) Execute fpstatus command. If "Status" of both paths is "Error," do not execute the rest of the procedures, return to Troubleshooting where you were originally referring to and execute the rest of the procedures. For the login, refer to "Maintenance Tool '1.3.2 Logging in to a node for executing commands' (MNTT 01-0200)".

(11) Check the firmware version. For the version confirmation, refer to the version control table (Web). Depending on the version of the firmware, downgrading of the firmware may be required.
For details about how to check the firmware version, refer to "Maintenance Tool '2.24 Checking the HBA Firmware Version (fchbafwlist)' (MNTT 02-1600.)"

(12) When the firmware version is appropriate, go to step (14).
If the firmware version is inappropriate, downgrade the firmware. For details about how to downgrade firmware, refer to "Maintenance Tool '2.25 Updating the HBA Firmware (fchbafwupdate)' (MNTT 02-1630.)"

(13) After downgrading the firmware, check the version.

(14) Return to step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)", and execute the rest of the procedures.

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D.1.7 Replacing the GbE-4Port Card

D.1.7.1 Replacing the GbE-4Port Card (cluster configuration)

CR220SM does not support the cluster configuration.

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D.1.7.2 Replacing the GbE-4Port Card (single node configuration)

NOTE:
- 10GbE-1Port card is not supported for this model.
- When replacing GbE-2Port card, read “GbE-4Port card” as “GbE-2Port card.”

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to “Maintenance Tool ‘2.28 Terminating the OS of This Side Node (nasshutdown)’ (MNTT 02-1740)”.

(2) Disconnect all the LAN cables from the GbE-4Port card.

(3) Refer to “Maintenance Manual Hitachi Compute Rack 220SM [System Unit]” and replace the GbE-4Port card.
After the replacement, the power source must be stopped because the cables are required to be connected.

NOTE: Precautions for parts replacement
- When replacing GbE-4Port card, replace it with the instruction described in “Maintenance Manual Hitachi Compute Rack 220SM [System Unit]” and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to ‘C.2.2.2 Failure determination procedure at the single node configuration’ and determine the subject parts.
- Make sure to collect Simple log by using HATP before the replacement. For the details, refer to “Maintenance Manual Hitachi Compute Rack 220SM [System Unit].”

(4) After replacing the GbE-4Port card, reconnect the cables where they were if they are all removed at the replacing procedure, and press the power switch on the node.

NOTE:
- Be sure to reconnect the LAN cables to the same ports as before.

(5) Confirm that the OS startup of the node is complete.
Refer to “Set Up ‘1.3 Startup Confirmation of the OS by using KVM’ (SETUP 01-0010)” and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to ‘C.2.4 Diagnosis for OS Boot Failure’ and execute the solution to the failure. After the failure is solved, proceed to the step (6).
If the login prompt window is displayed, proceed to the step (6).

(6) Check if the resource group is running normally.
Execute rgstatus command to confirm whether the resource group is running normally.
For the method for confirmation, refer to “Maintenance Tool ‘2.63 Resource group Status Display (rgstatus)’ (MNTT 02-3380)”.

(7) After the OS is started, check the following.
- Check the hardware status. Check that “up” is displayed in “Network Interface” on the screen as the status of the port which is used by the replaced card. For details about how to check the hardware status, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus)’.

(8) Return to the step (c) of “Replacement ‘1.2.2 Parts replacement only when the node is turned off (single node configuration)’ (REP 01-0090)” and execute the rest of the procedures.

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D.1.8 Replacing the GbE-2Port Card

This is not a part to be replaced.

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D.1.9 Replacing the Motherboard

D.1.9.1 Replacing the Motherboard (cluster configuration)

CR220SM does not support the cluster configuration.

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D.1.9.2 Replacing the Motherboard (single node configuration)

(1) The replacement of the motherboard requires confirming and resetting the BMC. Therefore, confirm the BMC setting information, and write down the setting information. For the confirmation of the BMC setting, execute bmcctl command. If you cannot log in to the node, ask the system administrator.
For more information about bmcctl command, refer to "Maintenance Tool '2.18 Setting BMC LAN Information (bmcctl)' (MNTT 02-1210)".

(2) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After confirming that, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(3) Disconnect all the external cables connected to the node (LAN cable, FC cable, and AC cable.)
Write down the connecting point of the cables to reconnect them after parts replacement.

(4) Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and replace the motherboard. After replacing it, reconnect all the cables except for network cables.

NOTE: Precautions for parts replacement

- Follow the instruction described in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" to replace the motherboard and to confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series.)
- Some results of HATP lead to additional possible suspect part replacement. In this case, return to 'C.2.2.2 Failure determination procedure at the single node configuration' and determine the part to be replaced.
- Resetting time of the motherboard as instructed in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" is not necessary (resetting will be performed in other procedure or by the OS.)
- Make sure to collect Simple log by using HATP before the replacement. For details, refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit.]"

(5) Reconnect all the network cables left.

(6) Check the BIOS version.
Check the BIOS version by referring to 'B.2.1 BIOS Version Checking Procedure,' and write down it as a record of the work.

(7) Check the BMC firmware version.
Check the BMC firmware version by referring to 'B.2.2 BMC Firmware Version Checking Procedure," and write down it as a record of the work.

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(8) Refer to "Set Up '9.1 UTC-based Time Setting' (SETUP 09-0000)", and acquire the UTC time from the maintenance PC and set the time of BIOS.

(8-1) Refer to 'B.2.7 Confirmation of CPU Virtualization Support Mechanism', and confirm the CPU virtualization support mechanism.

(9) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (10).
If the login prompt window is displayed, proceed to the step (10).

NOTE: Wait approximately 10 minutes until the OS is completely started.

(10) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally. For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

(11) Check if the BMC interface setting is identical with the setting information recorded in the procedure (1). If the setting is different, reconfigure the setting by the information recorded in the procedure (1).
For the BMC interface setting, refer to "Maintenance Tool '2.18 Setting BMC LAN Information (bmcctl)' (MNTT 02-1210)".

(12) After completion of step (11), check the following.
Check the hardware statuses on the both nodes to confirm that both "status" of "BMC Information" in the window are "ok". (For checking the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.

(13) Refer to 'B.2.9 Other Setting/Confirmation Items (1) Confirmation of the setting of Hyper-threading' and confirm that the setting of Hyper-threading is [Disabled].

(14) Collect the OS log of the node.
For the details about OS collection, refer to "Maintenance Tool '2.19 Collecting Logs (oslogget)' (MNTT 02-1300)".

(15) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.10 Replacing the DVD Drive

CR220SM does not incorporate DVD-ROM drive (it is an external device.)

For how to connect a DVD-ROM drive, refer to ‘A.2.1.2 External DVD-ROM drive.’

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D.1.11 Replacing the CPU

D.1.11.1 Replacing the CPU (cluster configuration)

CR220SM does not support the cluster configuration.

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D.1.11.2 Replacing the CPU (single node configuration)

(1) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Disconnect all the external cables connected to the node (LAN cable, FC cable, and AC cable.)
Write down the connecting point of the cables to reconnect them after parts replacement.

(3) Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and replace the CPU.

NOTE: Precautions for parts replacement

- Follow the instruction described in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" to replace the CPU and to confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series.)
- Some results of HATP lead to additional possible suspect part replacement. In this case, return to 'C.2.2.2 Failure determination procedure at the single node configuration' and determine the part to be replaced.
- Make sure to collect Simple log by using HATP before the replacement. For details, refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]"

(4) After replacing the CPU, reconnect all the cables to the original position if they were removed before replacing, and press the power button on the node.

(5) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (6).
If the login prompt window is displayed, proceed to the step (6).

NOTE: Wait approximately 10 minutes until the OS is completely started.

(6) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally. For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

(7) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.12 Replacing the HDD Backplane Board

D.1.12.1 Replacing the HDD Backplane Board (cluster configuration)

CR220SM does not support the cluster configuration.

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D.1.12.2 Replacing the HDD Backplane Board (single node configuration)

(1) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and replace the HDD Backplane Board.
When replacing a rear HDD Backplane Board, refer to "Rear HDD cage Kit" in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit] '7.10 HDD backplane, Expander Board, Rear HDD cage Kit.'"

NOTE: Precautions for parts replacement

- When replacing HDD Backplane Board, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.2 Failure determination procedure at the single node configuration' and determine the subject parts.

(3) After replacing the HDD Backplane Board, reconnect the cables where they were if they are all removed at the replacing operation, and press the power button on the node.

(4) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (5).
If the login prompt window is displayed, proceed to the step (5).

NOTE: Wait approximately 10 minutes until the OS is completely started.

(5) Check if the resource group is running normally.
Execute rgstatus command to confirm whether the resource group is running normally.
For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

(6) Check the hardware status.
Check the hardware status. Check whether "ok" is displayed for both 0 and 1 of "InternalHDD Information" on the screen.
For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.

(7) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.13 Replacing the Front Panel Board

D.1.13.1 Replacing the Front Panel Board (cluster configuration)

CR220SM does not support the cluster configuration.

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D.1.13.2 Replacing the Front Panel Board (single node configuration)

(1) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Disconnect all the external cables connected to the node (LAN cable, FC cable, and AC cable.)
Write down the connecting point of the cables to reconnect them after parts replacement.

(3) Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and replace the Front Panel Board.
After the replacement, the power source must be stopped because cable reconnection is required.

NOTE: Precautions for parts replacement

- Follow the instruction described in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" to replace the Front Panel Board and to confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series.)
- Some results of HATP lead to additional possible suspect part replacement. In this case, return to 'C.2.2.2 Failure determination procedure at the single node configuration' and determine the part to be replaced.

(4) After replacing the Front Panel Board, reconnect all the cables to the original position if they were removed before replacing, and press the power button on the node.

(5) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (6).
If the login prompt window is displayed, proceed to the step (6).

NOTE: Wait approximately 10 minutes until the OS is completely started.

(6) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally. For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

(7) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.14 Replacing the PS Backboard

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D.1.15 Replacing the Lithium Battery

D.1.15.1 Replacing the Lithium Battery (cluster configuration)

CR220SM does not support the cluster configuration.

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D.1.15.2 Replacing the Lithium Battery (single node configuration)

(1) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and replace the Lithium Battery.

NOTE: Precautions for parts replacement

- When replacing Lithium Battery, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.2 Failure determination procedure at the single node configuration' and determine the subject parts.
- Make sure to collect Simple log by using HATP before the replacement. For the details, refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]."

(3) After replacing the Lithium Battery, reconnect the cables where they were if they are all removed at the replacing operation, and press the power button on the node.

(4) Confirm the time of the node.
Refer to "Set Up '9.1 UTC-based Time Setting' (SETUP 09-0000)", acquire the UTC time from the maintenance PC and set the time of BIOS.

(5) Refer to 'B.2.7 Confirmation of CPU Virtualization Support Mechanism', and confirm the CPU virtualization support mechanism.

(6) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (7).
If the login prompt window is displayed, proceed to the step (7).

NOTE: Wait approximately 10 minutes until the OS is completely started.

(7) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally. For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

(8) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.16 Replacing the PCI Riser Board

D.1.16.1 Replacing the PCI Riser Board (cluster configuration)

CR220SM does not support the cluster configuration.

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D.1.16.2 Replacing the PCI Riser Board (single node configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and replace the PCI Riser Board.

NOTE: Precautions for parts replacement

- When replacing PCI Riser Board, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- There are two kinds in the PCI Riser Board: PCI Riser Board (Standard side) and PCI Riser Board (Lowprofile side.) For which PCI Riser Board is the target to be replaced, follow the instruction of "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]".
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.2 Failure determination procedure at the single node configuration' and determine the subject parts.
- Make sure to collect Simple log by using HATP before the replacement. For the details, refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]."

(3) After replacing the PCI Riser Board, reconnect the cables where they were if they are all removed at the replacing operation, and press the power button on the node.

(4) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (5).
If the login prompt window is displayed, proceed to the step (5).

NOTE: Wait approximately 10 minutes until the OS is completely started.

(5) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally. For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

(6) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.17 Replacing the CPU Heatsink

D.1.17.1 Replacing the CPU Heatsink (cluster configuration)

CR220SM does not support the cluster configuration.

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D.1.17.2 Replacing the CPU Heatsink (single node configuration)

(1) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Disconnect all the external cables connected to the node (LAN cable, FC cable, and AC cable.)
Write down the connecting point of the cables to reconnect them after parts replacement.

(3) Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and replace the CPU Heatsink..

NOTE: Precautions for parts replacement

- Follow the instruction described in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" to replace the CPU Heatsink and to confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series.)
- Some results of HATP lead to additional possible suspect part replacement. In this case, return to 'C.2.2.2 Failure determination procedure at the single node configuration' and determine the part to be replaced.

(4) After replacing the CPU Heatsink, reconnect all the cables to the original position if they were removed before replacing, and press the power button on the node.

(5) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (6).
If the login prompt window is displayed, proceed to the step (6).

NOTE: Wait approximately 10 minutes until the OS is completely started.

(6) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally. For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

(7) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.18 Replacing the CPU Air Duct

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D.1.19 Replacing the Cable

The various cables indicate that any of SAS Cable, FAN Signal Cable, FAN Power Cable, SGPIO Cable or HDD Power Cable connected inside the node.
For the LAN cable connected outside of the node, refer to "Replacement '1.5 Replacing the LAN Cable' (REP 01-0200)", and for FC cable, refer to "Replacement '1.4 Replacing the Fibre Channel Cable' (REP 01-0160)".

D.1.19.1 Replacing the Cable (cluster configuration)

CR220SM does not support the cluster configuration.

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D.1.19.2 Replacing the Cable (single node configuration)

(1) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Disconnect all the external cables connected to the node itself (LAN cable, FC cable, and AC cable.)
Write down the connecting point of the cables to reconnect them after parts replacement.

(3) Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and replace the cable to be replaced.

NOTE: Precautions for parts replacement

- Follow the instruction described in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" to replace cables and to confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series.)
- Some results of HATP lead to additional possible suspect part replacement. In this case, return to 'C.2.2.2 Failure determination procedure at the single node configuration' and determine the part to be replaced.

(4) After replacing the cable, reconnect all the disconnected cables to the original position if they were removed before replacing, and press the power button on the node.

(5) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (6).
If the login prompt window is displayed, proceed to the step (6).

NOTE: Wait approximately 10 minutes until the OS is completely started.

(6) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally. For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

(7) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.20 Replacing the BMC

Refer to ‘D.1.9 Replacing the Motherboard’, and execute the replacement of the motherboard.

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D.1.21 Replacing the Management Port

Refer to ‘D.1.8 Replacing the GbE-2Port Card’, and execute the replacement of the GbE-2Port card.

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D.1.22 Replacing the Internal RAID Battery

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D.1.23 Replacing the USB Board

D.1.23.1 Replacing the USB board (cluster configuration)

CR220SM does not support the cluster configuration.

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D.1.23.2 Replacing the USB board (single node configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and replace the USB board.

NOTE: Precautions for parts replacement

- When replacing USB board, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 220SM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.2 Failure determination procedure at the single node configuration' and determine the subject parts.

(3) After the USB board replacement is complete, in case the replacement operation was performed by removing all the cables, reconnect the cables where they were, and then turn on the power switch.

(4) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (5).
If the login prompt window is displayed, proceed to the step (5).

(5) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.24 Replacing the SFP module

NOTE:
- The SFP module can be replaced only when Hitachi HBA is used.
- Only the preventive replacement is supported.
- Always start the replacement from "Replacement '1.2 Parts Replacement only when the Node is Turned Off' (REP 01-0070)".

D.1.24.1 Replacing the SFP module (cluster configuration)

CR220SM does not support the cluster configuration.

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D.1.24.2 Replacing the SFP module (single node configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)."

(2) Disconnect Fibre Channel cables from all of the SFP modules to be replaced.

NOTE: Perform marking or take other measures so as to reconnect the cables properly.

(3) Replacing the SFP module
In the case of the preventive replacement for multiple SFP modules, repeat the steps from (3-1) to (3-3).

(3-1) Hold and open the bale clasp of the SFP module, referring to Figure D.1.24.2-1.

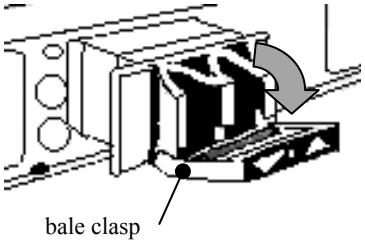

Figure D.1.24.2-1 SFP module replacement 1

(3-2) As shown in Figure D.1.24.2-2, pull out the SFP module gently in a horizontal direction from the Fibre Channel card.

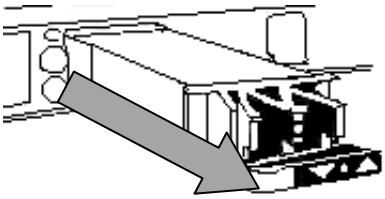

Figure D.1.24.2-2 SFP module replacement 2

(3-3) Gently insert the SFP module with the bale clasp unopened until a click sound is generated. Make sure that the SFP module is securely fixed.
Lightly press the SFP module for double checking.

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(4) Reconnect the cables that have been disconnected in step (2).

NOTE: If a FC-SW is used, port zoning might be applied, so make sure that the cables are connected to the appropriate ports.

(5) Turn the Power lamp on.
Log in the node from the maintenance PC after the OS is started up. Normally it takes approximately 10 minutes until the start up of the OS is complete.
Refer to "Maintenance Tool '1.3.2 Logging in to a node for executing commands' (MNTT 01-0200)" for logging in.

(6) Verify that the port of the installed SFP module is in the link-up state by mean of the LED indication on the SFP module. Refer to "Maintenance Manual Hitachi Compute Rack [I/O Adapter]" for how to check the LED indication.

(7) Execute the fpstatus command. Refer to "Maintenance Tool '2.5 Displaying the FC Status (fpstatus)' (MNTT 02-0280)" for the fpstatus command.
If "Status" of the path is "Error," verify the cable connection (erroneous wiring and connecting condition) again.

(8) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.2 Appendix.A A Node Replacement Procedure

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D.2 Appendix.A A Node Replacement Procedure

CR220SM does not support the procedure that replaces one node.

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